SOCIAL SCIENCES

INDUSTRIAL MEDICINE

Industrial Health, Occupational Medicine and Traumatic Surgery

October, 1945

Control of Health Hazards
— Medical and Environmental, in Aircraft Assembly —

Medical Service
— Evaluation by the Employer —

Experience with Veterans in Industry
— Follow-up Report —

The Future of Medicine
— In Industry —

A New Dressing
— For Burns and Extensive Abrasions —

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Silicosis
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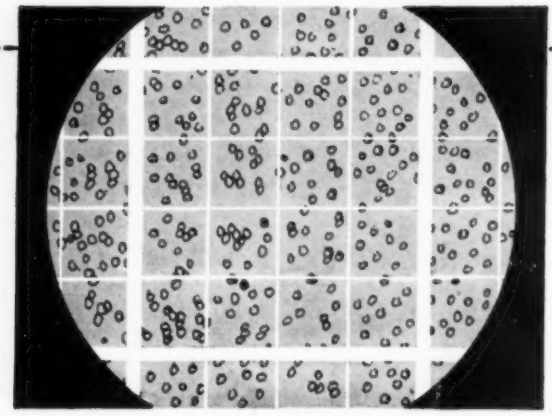
Volume 14 Number 10

Number 3 of a Series

IN ANEMIA OF CHRONIC BLOOD LOSS



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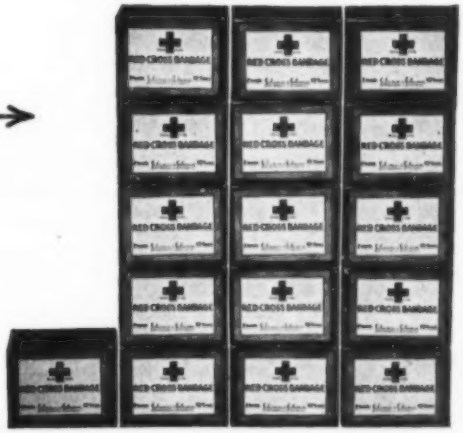

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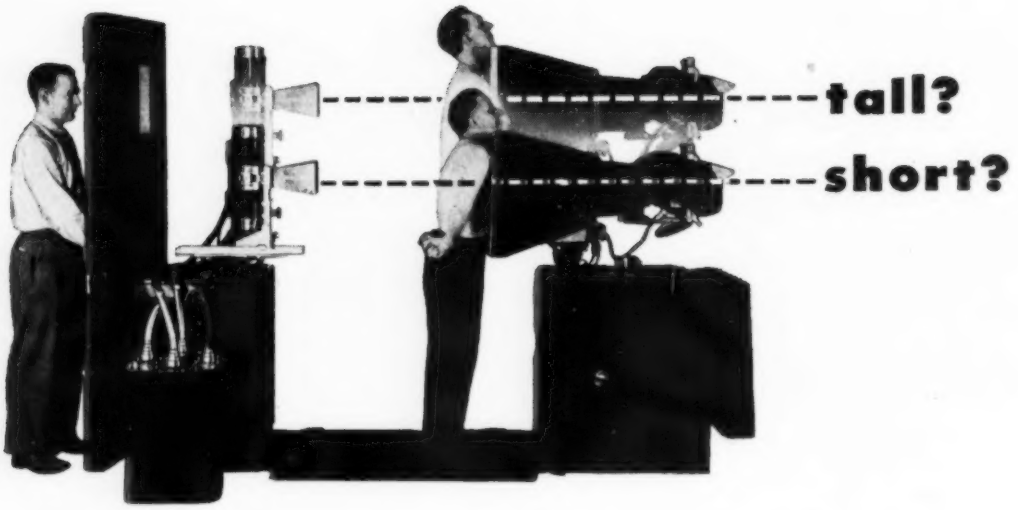

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THE RELATION of Hypersensitiveness to Poison Ivy and to the Pure Ingredients in Cashew Nut Shell Liquid and Related Substances: A Quantitative Study Based on Patch Tests,
by *Harry Keil, M.D., David Wasserman, Ph.D., and Charles R. Dawson, Ph.D.*

ARMY Industrial Medical Program at a Port of Embarkation,
by *Lieutenant Colonel Jean S. Felton*

FRACTURE Therapy by Internal and External Fixation,
by *Bennett R. Parker, M.D., F.A.C.S.*

THE THYMOL-BARBITONE Test in Clinical Practice,
by *Carey P. McCord, M.D., Lewis L. Kline, M.D., and Pearl Williams, B.S.*

A DISCUSSION of the Commoner Industrial Dermatoses,
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RATES of Absenteeism and Turnover in Personnel,
by *Keeve Brodman, M.D.*

CONTROLLED Industrial Sanitation: A Precision Tool for Industrial Hygiene,
by *Mohe H. Solworth*

AS A PART of our contribution to the reconversion program, we waited in suspense for three weeks and two days (October 1-23) while the employing printers of the Chicago area were engaged in certain negotiations with their compositors. During that time our production facilities were not producing, and when the strike was settled and work was resumed, on October 24, our schedules were thus considerably out of gear. But the time element was cracking its whip nevertheless, and so a number of the features planned for this issue are deferred to the next. Among the postponements—in addition to the Industrial Hygiene Section, which will appear in November instead of in the October issue as usual—are (1) "The Relation of Hypersensitiveness to Poison Ivy and to the Pure Ingredients in Cashew Nut Shell Liquid and Related Substances," by HARRY KEIL, M.D., DAVID WASSERMAN, PH.D., and CHARLES R. DAWSON, PH.D.; (2) "Army Industrial Medical Program at a Port of Embarkation" by LIEUTENANT COLONEL JEAN S. FELTON; and (3) "Fracture Therapy by Internal and External Fixation," by BENNETT R. PARKER, M.D., F.A.C.S. These will follow in early issues, together with other features, notably "The Thymol-Barbitone Test in Clinical Practice," by CAREY P. MCCORD, M.D., LEWIS L. KLINE, M.D., and PEARL WILLIAMS, B.S. Incidentally, DR. MCCORD'S newest book, "A Blind Hog's Acorns," is soon to be issued. This is in popular vein; he calls it an "attenuated autobiography," and it has numerous "best-seller" characteristics. But, more later. A feature of the postponed Industrial Hygiene Section next month, is an unusually comprehensive and complete study of "Maximum Allowable Concentrations of Atmospheric Contaminants," by WARREN COOK. And DR. PILGRIM,

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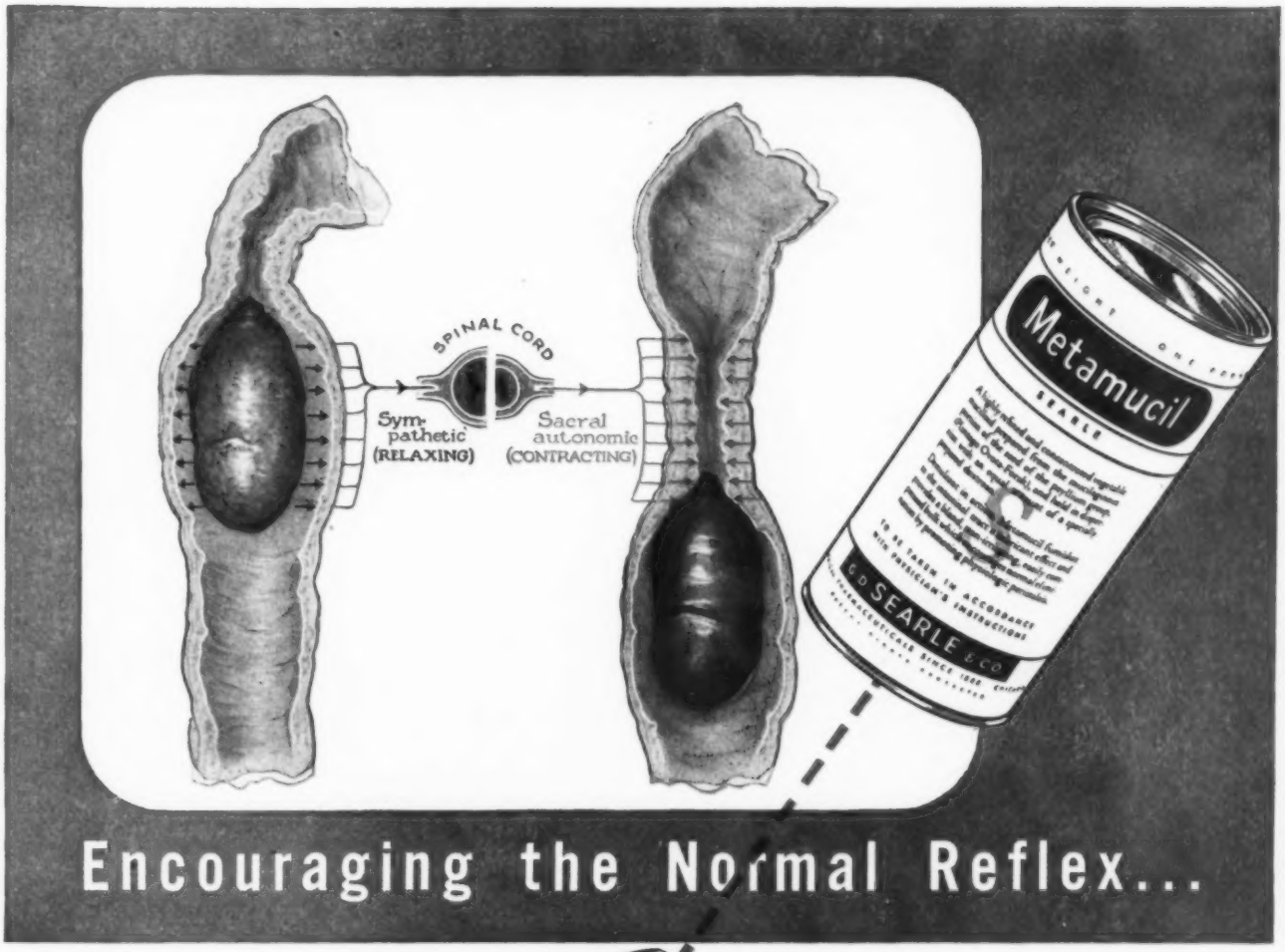

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RESEARCH IN THE SERVICE OF MEDICINE

—*Continued from page 3.*

which we learn is widely noted, will be resumed with the November number. Now—and back to these pages—we have endeavored, by naming them on the front cover, to call special attention to DR. JACKSON'S "Industrial Rehabilitation" (page 813), and DR. MACGREGOR'S "Silicosis—Its Prevention and Treatment" (page 815), both of which, because they are reprinted here, with full credit to their journals of original publication, are included under "Current Articles of Quality." They *are* of feature quality, in subject matter and interest. . . . DR. SAPPINGTON'S report of the Five-State Regional Governmental Industrial Hygiene Conference held at Philadelphia, September 25-26, will appear in November. In the meantime one of the papers read at that Conference, the "Value of Industrial Health to Labor," by JOHN A. PHILLIPS, appears on page 798, with an editorial comment on page 800. . . . THE subject of housing is of considerable interest to industry in its relation to work-time efficiency. Good housing or the lack of it may be one of those off-the-job matters which have an influence on absenteeism, productive ability, and accidents. Where the effects of this influence come within his area of responsibility, housing, as such, is of interest to the industrial physician. At the point of that interest, it may be remarked, however, without any levity, that housing "begins at home." One respect in which this is very apparent is suggested by MARILYN JOHNSON, in "Planning Industrial Safety for the Handicapped" (page 799). A great deal is being said and written about easing the path of the handicapped veterans on their return to work. Much of this is useful; some of it is merely the echo of theory. All of it will be helped by a little of such thoughtfulness as this article suggests. It is fine, of course, to "open the door for the veteran." He, however, might appreciate the practical, though small, attention to the door which would fix it so that he will be able to open it himself. And the helping hand up the steps of restoration to usefulness might consist, in practical part, of an elevator in the building where he works. This article and its connotations are worth thinking about. . . . AGAINST the "Bias" (page 800) unfortunately apparent in a very able presentation (page 798), the words of DR. BARTLE (page 795), are, as he might put it: "important, refreshing and convincing." He says: "The future of medicine in industry is assured, its leadership will command the best available. It will be broad, sympathetic and concerned in human interest and relations. It will be fair and open-minded to industry and labor. It will acknowledge remunerative principles in adjusting personal losses and handicaps. And it will hold aloof from compromising situations, prejudiced reactions and unethical practices." That, in general, has also been its past, and is now its present. . . . DR. BULMER'S suggestions on "How the Employer May Evaluate his Medical Service" (page 787) develop a yardstick in terms of the cost per visit to the medical department, as well as the cost per worker per year. Cost, however, important as the figures may be to the accounting department, is only one side of the picture. The other side is implicit throughout DR. BULMER'S article; it will be explicit to the discerning reader. . . . ON BEHALF of our Editor (who also plays the piano), and with respect to the temporarily abbreviated make-up of this issue, may we venture to say: "Don't shoot the piano player. He's doing the best he can."

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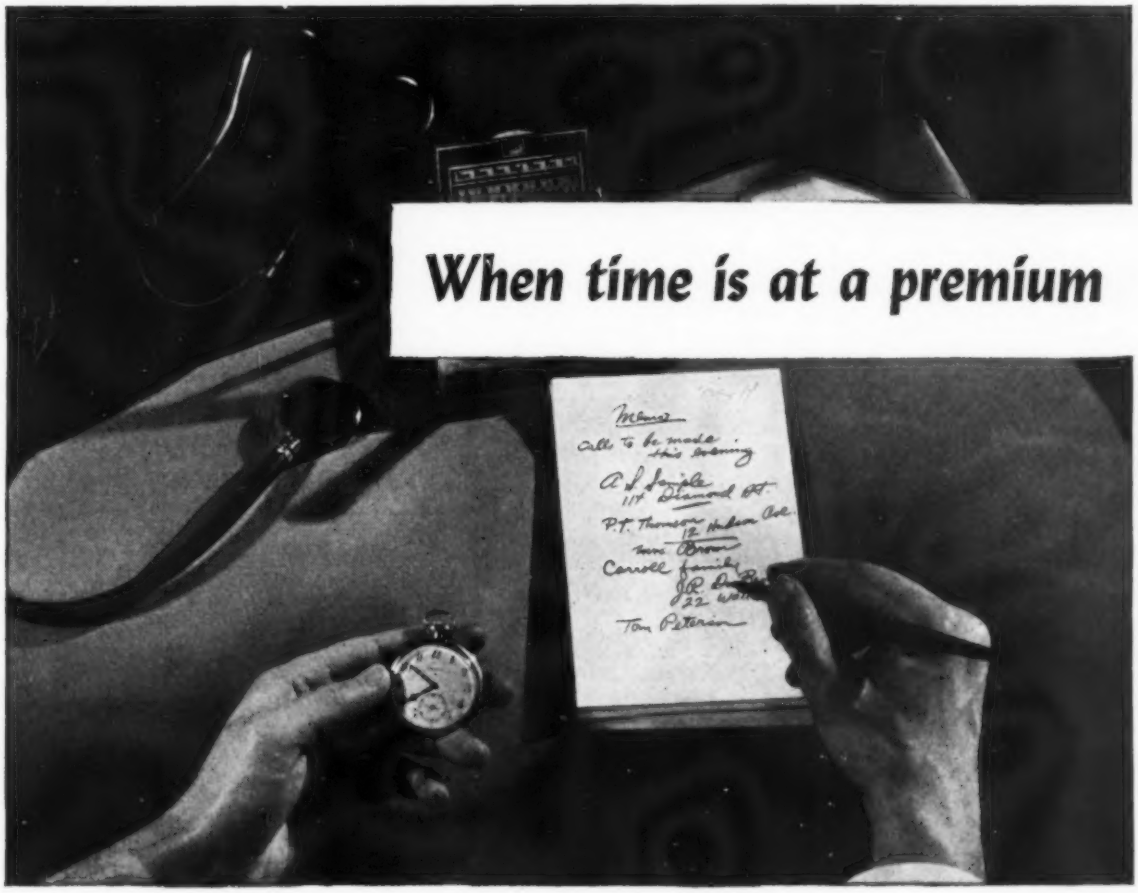

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MEDICAL and SURGICAL
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PERSONAL

DR. HAROLD A. VONACHEN, Medical Director, Caterpillar Tractor Company, Peoria, Illinois, is one of the medical members of the committee of 15 to recommend a program for the treatment of neuropsychiatric veterans, and to suggest locations for the four rehabilitation centers to be built downstate, recently appointed by GENERAL CASSIUS POUST, state welfare director. The survey work will be headed by DR. DAVID SLIGHT, of the University of Chicago.

JAMES H. ROOK, who has been Industrial Hygienist at the Dodge-Chicago Plant since October, 1943, will return to his former position as Industrial Hygiene Chemist for the Chrysler Corporation in Detroit.

DR. CHARLES M. MCGILL, of the U. S. Public Health Service, is the new Chief of Industrial Hygiene, Ohio State Department of Health. DR. MCGILL received a B.S. degree from the University of Washington, Seattle, in 1930, and graduated at the Vanderbilt University School of Medicine, Nashville, in 1935. Following an internship at the U. S. Marine Hospital, Seattle, and a residency in medicine at the U. S. Marine Hospital, Cleveland, he was commissioned in the U. S. Public Health Service in 1936. His duties since that time have included: U. S. Quarantine Stations, six months; research in the therapy of human malaria, Georgia and South Carolina, two years, and local health work in Georgia, two years; hospital training, eye, ear, nose and throat, Boston, one year; industrial health work, Southern United States, one year; assistant chief health consultant, U. S. Maritime Commission Gulf Coast Region, two years. In July, 1945, DR. MCGILL completed a post-graduate course at the Harvard School of Public Health, and received the degree of M.P.H. in Industrial Hygiene. He succeeds DR. CHRISTOPHER LEGGO, who resigned several months ago, to become Medical Director of Clinton Engineer Works, Tennessee Eastman Corporation, Oak Ridge, Tennessee.

DR. LEWIS J. GRAHAM has been appointed Medical Director of the Corning Glass Works, Corning, New York. He succeeds the late DR. WILLIS C. TEMPLER who died last May. DR. GRAHAM was honorably discharged from the U. S. Navy in September after more than three years' service as a lieutenant. He spent 13 months in the Southwest

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Pacific battle area with the U. S. Marines; he served at Tarawa tending wounded and performing emergency operations in the thick of battle. He was associated with DR. TEMPLER for a number of years at Corning Glass Works prior to entering the Navy. Born in Allegany County, he is a graduate of both Alfred University and Rochester Medical School, taking his medical degree at the latter institution.

J. C. RADCLIFFE was appointed by the New Jersey State Board of Health at its last meeting as Chief of the Bureau of Industrial Health, effective October 1, 1945. Mr. Radcliffe has been with the Bureau as Industrial Hygiene Engineer, and has wide acquaintance among New Jersey management groups.

COLONEL THOMAS C. GENTRY, Surgeon, 14th Air Force of the United States Army Medical Corps, has been appointed Medical Director of American Airlines, Inc., effective September 1, 1945. He succeeds LIEUTENANT COLONEL EDWARD C. GREENE, U. S. Army retired. COLONEL GENTRY was born in Dallas, Texas, and attended the public schools there. He took his college work at Baylor University in Waco, Texas, graduating A. B. in 1925. He graduated in medicine at Baylor College of Medicine, in Dallas, in 1929. Following medical school, he entered the army medical corps as an intern. In 1931 he graduated from the School of Aviation Medicine as a Flight Surgeon. In 1934, he resigned his army commission in order to engage in private practice at Hamlin, Texas, where he established and operated a private hospital. Re-entering the army as a reserve officer with the rank of Captain in 1935, he went to Fitzsimons General Hospital, Denver, Colorado. In 1940 he was transferred to Fort Bragg, North Carolina, and in March, 1941, was promoted to Major. In the summer of 1941, he gave up his commission to organize the medical service of the original Flying Tigers. He went to China as Chief Surgeon of the American Volunteer Group, the original Flying Tigers, serving in this position under General Claire L. Chennault, Founder of the Flying Tigers and commanding general of the succeeding China Air Task Force and the 14th Air Force. When the A.V.G. became part of the U. S. Army Air Force in June, 1942, DR. GENTRY continued working under General Chennault as Chief Surgeon of the 14th Air Force. In July, 1942, he was promoted to the rank of Lieutenant Colonel, and in May, 1943, he was made a full Colonel. He has done post-graduate work at Mayo Clinic and at Harvard University. He holds the Legion of Merit for his work in establishing emergency hospitals in China; and the Distinguished Flying Cross and the Air Medal for his participation in the evacuation of sick and

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wounded in China and over the Hump into India. In addition to being made an Honorary Flight Surgeon of the Chinese Air Force, the Chinese government awarded DR. GENTRY its Order of The Precious Tripod for meritorious service during the war. He is a member of the American Medical Association, the Association of Military Surgeons and the Texas Medical Society. LIEUTENANT COLONEL EDWARD C. GREENE, retiring Medical Director of American Airlines, Inc., whose 23 years of service with the regular army took him all over the world from the Philippines to France during World War I, is a Connecticut Yankee by birth. He took his pre-medical training at Yale and his degree in medicine at the University of Michigan where he majored in psychiatry and aviation medicine. COLONEL GREENE was teaching psychiatry at the School of Aviation in San Antonio, Texas, at the time that COLONEL GENTRY was a student officer there.

GENERAL

THE Sixth Annual Meeting of The AMBULATORY FRACTURE ASSOCIATION will be held in the Club Building at the Palmer House on October 26 and 27, 1945. The annual dinner will be held on Friday evening in the Red Lacquer Room. DR. CUSTIS LEE HALL, of Washington, D. C., will be the dinner speaker, and DR. ROGER ANDERSON, of Seattle, Washington, will be on the program. The meeting will be continued in Bloomington, Illinois, on October 29 and 30, where arrangements have been made for operative clinics and clinical conferences.

Industrial Nurses' Institute

ON OCTOBER 24, 1945, the Industrial Nurses' Section of The Maryland State Organization for Public Health Nursing, is conducting an educational Industrial Nurses' Institute which is to be sponsored by Liberty Mutual Insurance Company. Programs will be furnished by The Maryland Casualty Company. The meeting will be held at the Emerson Hotel in Baltimore, Maryland. The first session will begin at 9:00 A.M. There will be a number of distinguished speakers including DR. WILLIAM J. FULTON, Medical Director, Eastern Aircraft and Chevrolet

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TO provide an organization, not for pecuniary profit, in which all agencies and societies, both medical and lay, concerned with the problems of industrial health can hold membership and can meet together in conference for the study, discussion and careful consideration of all industrial health problems and procedure; to engage in scientific research to determine the cause, nature, prevention and cure of diseases and injuries of occupations; to assist in establishing and supervising industrial health clinics to serve small industries; to establish and maintain hospitals which will furnish facilities for the care, treatment and study of occupational injuries and diseases; to make surveys of industrial medical services and recommendations for their improvement; to solicit, receive and administer funds for any purpose that will advance and/or improve industrial health; to establish undergraduate and/or post-graduate courses in industrial medicine and surgery and/or to cooperate with medical schools and industries in maintaining such courses; and to use all those means, which from time to time, may seem wise, for the advancement of industrial health.

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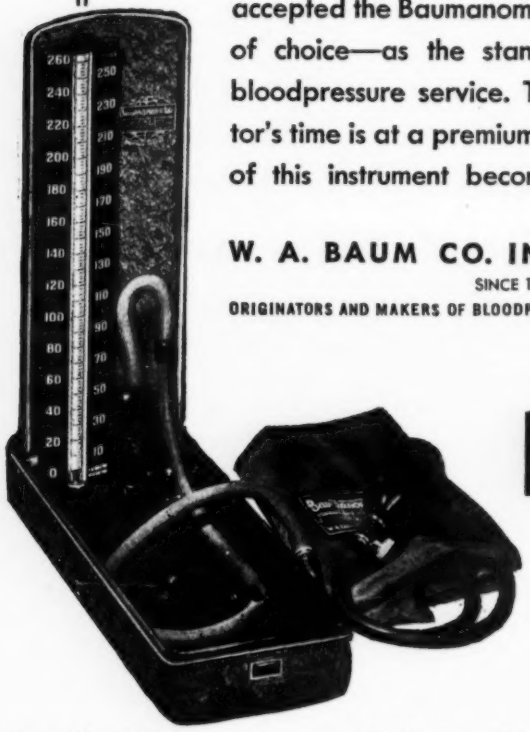

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Conference on Tuberculosis

A CONFERENCE on Control of Tuberculosis in a Metropolitan Area, sponsored by the Institute of Medicine of Chicago, will be held on Tuesday and Wednesday, November 13 and 14, 1945, at the Palmer House, Chicago, and will cover phases that are of particular importance at this time to clinicians, specialists, lay workers, and teachers, who are cordially invited to attend.

Industrial Medical Relations

WAYNE University School of Occupational Health announces a series of conferences on industrial medical relations, 13 consecutive lectures on "Human Problems in Industrial Employment," to be conducted at the Hotel Wardell-Sheraton, Detroit. Topics to be considered in the conference include: *September 19*, Problems of Matching the Employee and the Job; *September 26*, Problems of Supervisor-Employee Relations in the Job Adjustment; *October 3*, Human Relations in Industry; *October 10*, The Psychologist and Industrial Relations; *October 17*, subject not announced; *October 24*, The Psychiatrist and Industrial Relations; *October 31*, Technics for Measuring and Evaluating Individual Behavior; *November 7*, Occupational Fatigue; *November 14*, Research Approach to the Study of Human Relations; *November 21*, Clinical Interpretation of Behavior in the Measure of Occupational Fitness; *November 28*, The Interdependence of Occupational and Nonoccupational Personal and Health Factors in Continued Job Adjustment; *December 5* and *12*, subjects not announced. In a statement to the press DR. RAYMOND HUSSEY, dean of the Wayne University School of Occupational Health, said that the program is offered as a community service. It is designed especially for physicians who are interested in the practice of medicine in its application to industral health.

Pennsylvania

THE report for the fiscal year ending July 1, 1945, has been compiled recently by the statistician of the Pennsylvania Bureau of Industrial Hygiene. During the year, visits were made to 7,983 plants with 1,477,361 employees. A break-down of this tabulation of visits shows that hazards were investigated in 6,687 plants with 1,038,572 employees, and that recommendations for the improvement of environmental conditions were made in 2,184 plants with 219,347 employees. Engineering studies were conducted in 63 plants with 101,432 employees, and a total of 1,410 follow-up visits, to check on compliance with recommendations previously made, were carried out. These plants have a population of 110,501 employees. A total of 711 samples were collected, upon which 1,407 determinations were made.

Health Hazards

STUDY of Los Angeles electroplating plants, initiated by the Division of Industrial Hygiene in April, has shown such remarkable improvement in conditions since a similar survey conducted in 1941, that the industry was given commendation for interest and cooperation in improving working conditions. The earlier study had revealed at least one industrial health hazard in every plant, involving dusts, mists, gases, vapors, illumination, sanitation. In the 15 plants visited by the end of April in the current study, these hazards had been eliminated. Chromium plating, cyanide plating, and trichlorethylene degreasing tanks were found to be equipped with adequate slot exhaust ventilation; all bright dip tanks were either exhaust ventilated or isolated in open sheds; buffing and polishing wheels were provided with exhaust ventilation; the majority of washing and toilet rooms met minimum sanitation requirements; and fluorescent fixtures had replaced many of the bare, unshaded incandescent bulbs.

—*California & Western Medicine*, August, 1945.

Women Exercise Care

HAVING tabulated and analyzed work injuries to women in shipyards, 1943-44, the Industrial Hazards Division, Bureau of Labor Statistics, U. S. Department of Labor, reports, in part: Women score decidedly better than men in use of protective equipment. Injuries caused by failure to wear goggles constituted, in the case of women, 11.9% of all injuries; in the case of men, 18.8%. In four shipyard departments studied, men suffered

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more eye injuries due to foreign particles than did women: in welding, the percentage was nearly three times as frequent in men; in assembly and sheet-metal work, over four times; in electrical work, where such hazard is slighter, 5.2% of injuries to men were due to foreign bodies, 3.5% of injuries to women. In three departments men suffered a greater percentage of welder's flash; only in assembly work did the women's percentage exceed that of the men.

—Note and Comment, in *The Sight-Saving Review*, Spring, 1945.

For First-Aiders

STANDING Orders for First-Aid Workers in Industry, to serve as a guide for emergency treatment of injured persons, have been prepared by American Mutual Liability Insurance Company for its industrial policyholders. The subject matter covers the recognition and proper emergency treatment of a wide variety of industrial injuries. Considerable space is devoted to discussion of supplies, records, physical arrangements of first-aid rooms, transportation of injured persons, and emergency procedures in industry. Inasmuch as it is impossible to make a general book of this nature 100% applicable to one particular plant or situation, the foreword cautions: "It should be understood that these 'Orders' are subject to approval, amendment, or revision by the plant physician as may, in his opinion, be necessary or desirable, and before they become effective they should bear his signature of approval." Copies of these "Standing Orders" will be sent on request as long as the supply lasts. Address American Mutual, Public Relations Division, 142 Berkeley St., Boston 16, Mass.

M.D.s Threaten to Quit

THE military government of Argentina encountered new troubles today as a group of physicians threatened to suspend their scientific activities, and a local union took sides with striking transport company employees the government had ordered back to work. The Union Obrera local threatened a sympathy strike to support the transport workers "when circumstances demand." The Argentine Medical Association resolved in a meeting to ask its board of directors to "suspend the association's scientific activities until constitutional normalcy is restored." The physicians' resolution said an "atmosphere of liberty, confidence, security, and tranquillity are absolutely indispensable" to investigation for scientific progress, and declared "it is notorious that such conditions do not exist presently in Argentina." The action followed a similar protest by the nation's lawyers, who halted their activities and caused a virtual standstill in Argentina's courts.

—*Chicago Tribune*, September 14, 1945.

Occupational Health Research

ARTICLES of incorporation for a new non-profit corporation to be known as the Institute for Occupational Health Research will be filed in Lansing next month, it was announced September 2. The institute will be staffed with specialists in the medical and engineering phases of employee health and will maintain research laboratories. Subject to approval by the board of education, the institute will be affiliated with and housed with Wayne University's new School of Occupational Health, whose program is entirely financed by the Medical Science Center. DR. RAYMOND HUSSEY, dean of the school, will serve as director of the institute. The sum of $750,000 is now being raised by the Medical Science Center to finance the joint program of the school and the institute for the first five years. The affiliated school and institute will be both a service unit for industry and an educational institution. The school will educate, on a post-graduate level, graduate doctors and engineers who wish to specialize in the field of occupational health. In addition, courses will be available to industrial physicians and hygiene engineers. Later the school will arrange special courses for the training of technicians. For graduate doctors and engineers the school will offer a two year course, of which half the time will be spent in plants. On graduation, doctors will receive the degree of doctor of industrial health, and engineers the degree of doctor of science in industrial health. The staff and laboratory of the institute will be available to industry at reasonable cost. In general it will concern itself with the

—*Continued on page 802.*

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Tyrothricin, the new, stable antibiotic for topical use, has proved remarkably effective against certain organisms (streptococci, staphylococci, pneumococci, diphtheria bacilli) commonly encountered in upper respiratory tract infections.

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'PROTHRICIN' is an ideal topical nasal application because: It is an isotonic buffered solution with a *pH of 5.5 to 6.5* that restores the optimal acid-base equilibrium of the nose, and serves to establish normal nasal function.

It produces a moderate duration of constriction *without secondary swelling of the mucosa* and other side-effects commonly associated with ephedrine-like drugs.

Its bactericidal action is due to an antibiotic, which, like penicillin, in contradistinction to sulfonamides, has a somewhat broader activity, and *has not been found to cause sensitization* as in the case of sulfonamides.

It maintains *antibiotic action in the presence of pus and mucus.*

It is relatively *nonirritating* and *nontoxic* to nasal and sinus mucosa.

Its *low surface tension* (approximately 40 dynes per centimeter) affords sufficient penetration into the interstices of the mucosa to combat acute infection and afford prompt relief.

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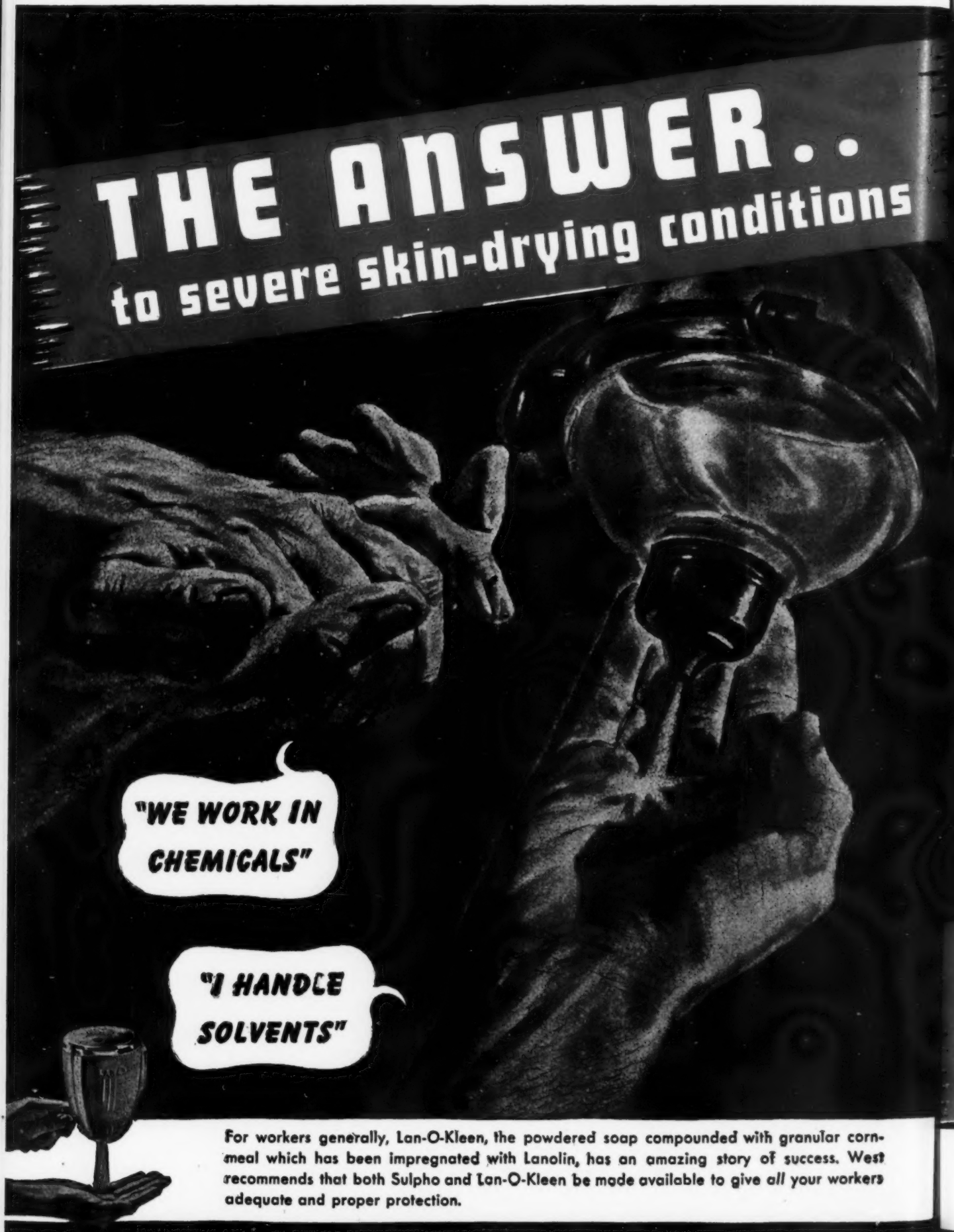

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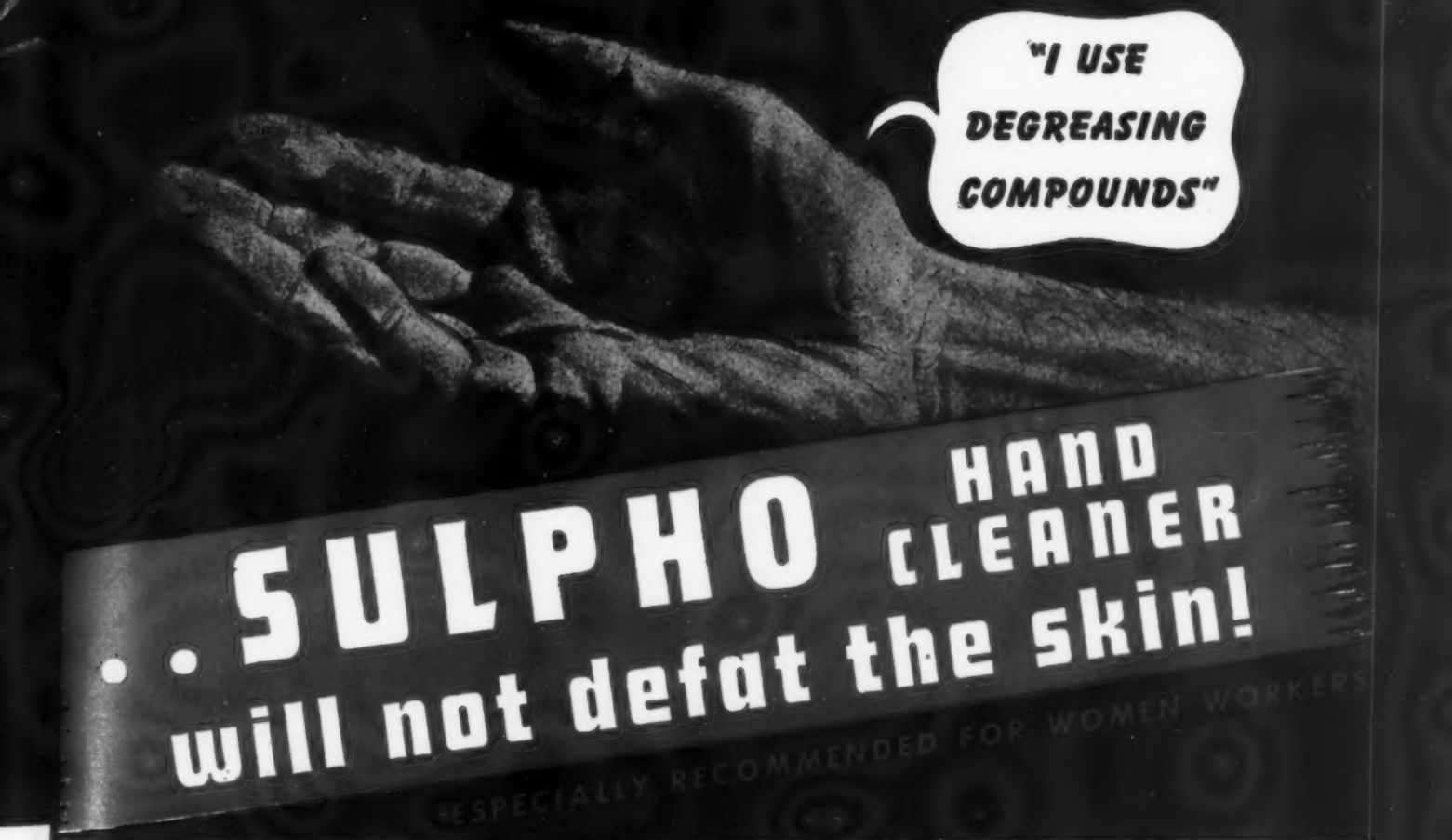
*The above is part of Reprint No. 2311 from the Public Health Reports Vol. 56, No. 36 by Dr. Louis Schwartz.



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EFFECTIVE TOPICAL CHEMOTHERAPY IN COMMON OTOLOGIC INFECTIONS

White's OTOMIDE

Both *acute* and *chronic* suppurative and nonsuppurative infections of the middle and external ear respond to the well-balanced formula of White's Otomide.

FORMULA

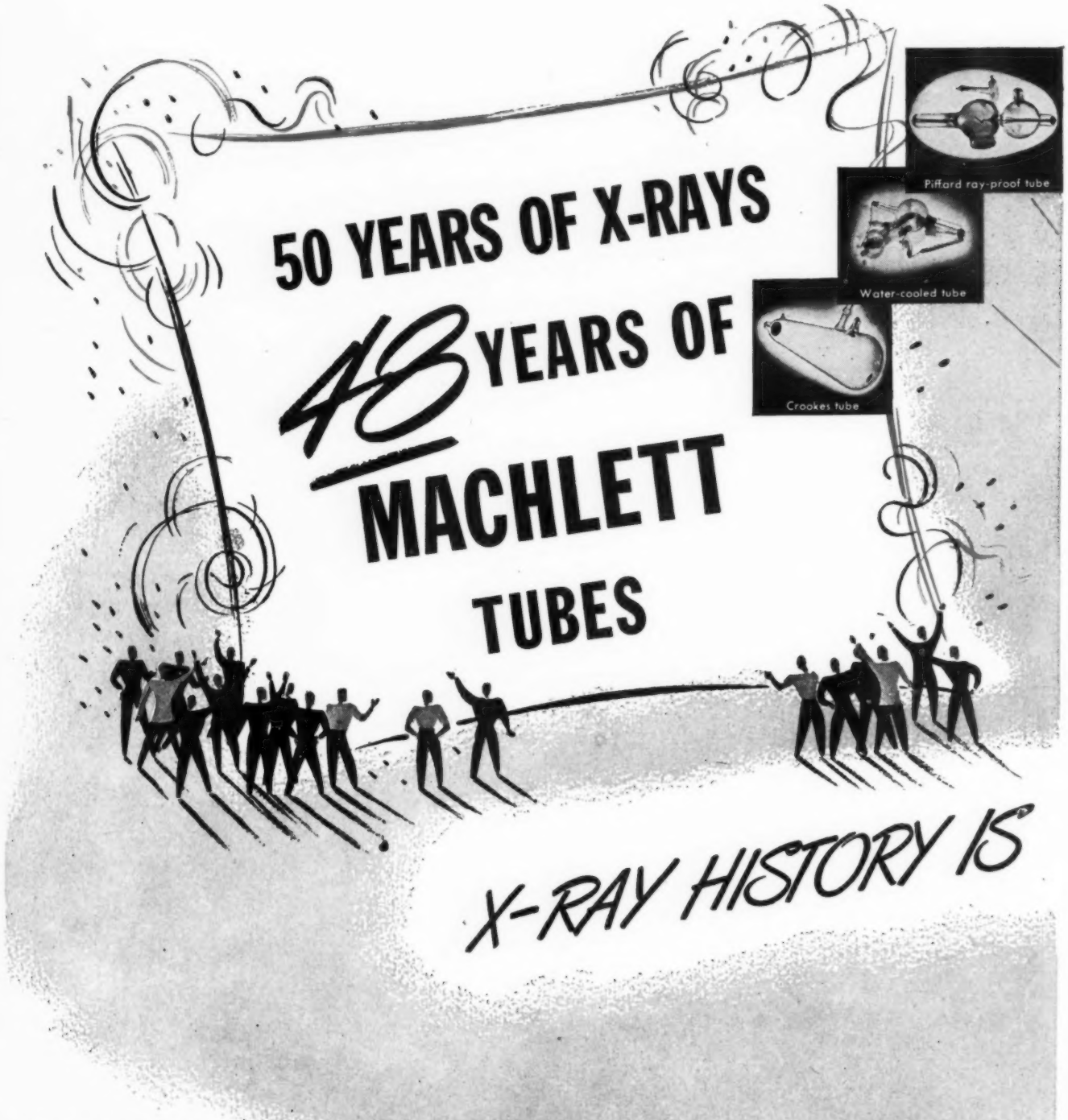
Sulfanilamide	5%
Carbamide (urea)	10%
Chlorobutanol (compatible with sulfonamide)	3%
Glycerin (High specific gravity)	q.s.

RATIONALE AND ADVANTAGES

1. *Wide Field*—effective in *BOTH* acute *AND* chronic otologic infections.
2. *Well Tolerated*—physiologic pH—hence free from irritation.
3. *High Stability*—a *stable* sulfonamide-urea solution.
4. *Antibacterial Potency with Analgesia*—effective chlorobutanol analgesia *without* impaired sulfonamide activity.
5. *Hygroscopic*—glycerin vehicle re-distilled for unusual hygroscopic activity.

White's Otomide is available in dropper bottles of one-half fluid ounce (15 cc.)—*on prescription only.*

PHARMACEUTICAL White LABORATORIES, INC. NEWARK 2, N. J. MANUFACTURERS



IT WAS 50 YEARS AGO, on November 8, 1895, that scientific investigation led Roentgen to the discovery of X-rays. In this semi-centennial year we honor his work, and the work of the pioneers who, sometimes at the sacrifice of their own lives, developed the theory and practice of a science that today means so much to all mankind.

Very soon after Roentgen publicly announced his discovery in 1896, Robert H. Machlett made the first practical American X-ray tube. Quickly he improved his techniques, creating a whole series of "firsts" such as the first ray-proof tube, the first cooled by water, the first for contact therapy. The organization he founded carries on his principle of constant research, improvement and initiative, and has many other firsts to its credit, culminating in the amazing and unique 2,000,000-volt, direct current, sealed-off, precision X-ray tube.

To a large extent, X-ray history is Machlett history, a history of service to mankind. Today, Machlett tubes are in use by doctors, hospitals, laboratories and factories in many parts of the world, saving lives, inspecting products, performing delicate analyses, expanding man's knowledge, serving with unmatched exactitude and economy. For the future, Machlett's talents will create other and still more valuable applications, for Machlett never stands still, is always creative, improving its tubes, developing new ones for old and new services.

In addition to X-ray tubes for all purposes, we also make oscillators, amplifiers and rectifiers for radio and industrial uses, all to the same high (and unmatched) standards to which our X-ray tubes are held. It will pay you to buy Machlett tubes. For information as to the available types, write Machlett Laboratories, Inc., Springdale, Connecticut.

Cornell contact therapy tube
Transformer tube
Pyrex heavy anode bulb tube, type MR
Compact ray-proof tube, type CYR
Small shockproof tube, type CYS
Silver-bearing long-life rotating target tube, type DX
Tube with beryllium window and hooded anode, 250 k. v., type IR
Tube with vacuum-tight beryllium window in envelope—the Diffraction Tube
2,000,000 volt direct current precision radiographic tube, type VM

first

MACHLETT-HISTORY!

From the Beginning

"When in 1895 Professor Roentgen announced his discovery, Machlett was immediately interested and began experiments to reproduce the results of Roentgen. He was ideally equipped for such work, for just at that time he had perfected a mercury pump capable of producing a very high vacuum. He attacked the difficult task and before many days had passed, succeeded in producing the first X-ray tube in this country."—I. S. Hirsch, *Radiology* 8:254, 1927.

MACHLETT

RAY TUBES SINCE 1897

TODAY THEIR LARGEST MAKER

Quality
COUNTS, TODAY...

MORE THAN EVER, the inherently superior qualities which characterize every surgical instrument bearing the Kny-Scheerer trademark become doubly important to the discriminating surgeon during this period of national emergency.

Technical correctness of design and construction, comparable only to the finest instruments previously imported . . . precision accuracy, the contribution of meticulously trained craftsmen . . . functional dependability, the resultant use of superior materials and production methods, —all are distinctive features of basic importance. Economically, they insure longer periods of satisfactory instrument service. Clinically, they aid in the more successful attainment of the surgical objective.

Your dealer can supply you

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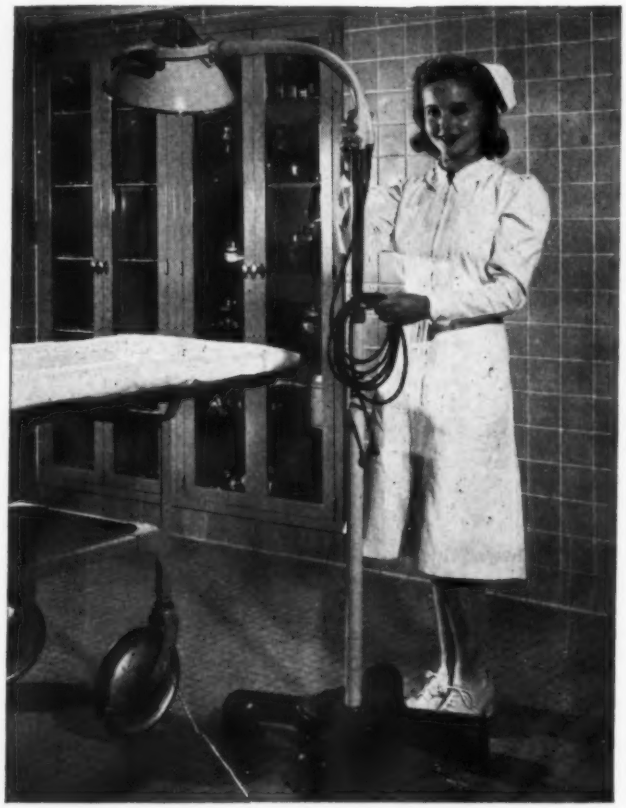
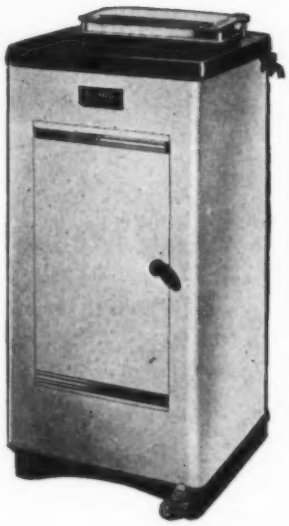
LET *Castle* EQUIPMENT HELP YOU PROTECT PLANT PERSONNEL . . .

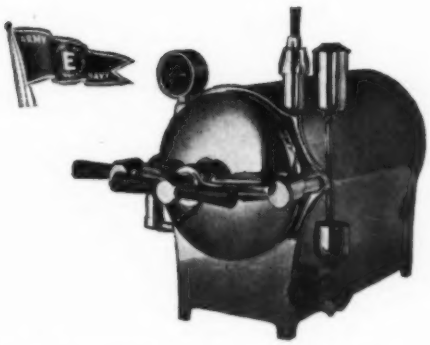


You guarantee hospital safety for you and your patients when you use Castle Lights and Sterilizers. You and your staff do a better, more efficient job, for Castle equipment is scientific in operation and designed for trouble-free performance that requires little or no attention from the busy doctor or nurse.

For further details of Castle's complete line of lights and sterilizers, write: Wilmot Castle Company, 1161 University Avenue, Rochester 7, N. Y.

CASTLE "46" is a new portable light with unusual ease and range of vertical adjustment (48" to 75"), plus greater mobility and increased versatility in lighting angles. It is truly a portable light that meets every medical lighting need, short of major surgery.





CASTLE "666" autoclave, 8" x 16" is steam jacketed with entire body Cast-In-Bronze. Has double "Full-Automatic" control for both pressure and low water Cut-off.

CASTLE "95" is a smartly styled cabinet sterilizer, with Cast-In-Bronze boiler, silent oil check foot lift that eliminates hand contamination, and Castle's famous "Full Automatic" control that provides complete sterilizing safety and effectiveness.

CASTLE "669" combines an autoclave, a boiling water sterilizer, and large, double roomy cabinet. It features the same standards of construction as the Castle Hospital Sterilizers. Available in "673" model without autoclave.

Castle LIGHTS and STERILIZERS

ON THE ROLE OF *Protective* FOODS IN CANDIES

THE nutrient value of sugar in candies is well known—it supplies high caloric energy in small bulk, energy which becomes promptly available, with remarkably little digestive effort. The fatigue-dispelling efficacy of candy has gained added recognition during these war years.

But in the minds of many physicians candy is little but sugar. What are the facts?

During the past two decades especially—since the coming of the candy bar—the greater percentage of candies have come to contain more and more of the recognized protective foods. On the basis of the candy industry's consumption of these foods it becomes apparent that the nutritional contribution of such candies goes considerably beyond merely the caloric value of their contained carbohydrate. Note these figures:

During 1943 the candy industry used 250,000,000 lbs. of nuts and peanuts, 10,000,000 lbs. of fruits, 6,000,000 lbs. of eggs, 400,000,000 lbs. of milk, cream, and butter, and 400,000,000 lbs. of chocolate.

Whatever these foods contain of protein, fat, and the noncaloric so-called protective food factors such as vitamins and minerals, becomes part and parcel of the candies in which they are used.

THE NUTRITIONAL PLATFORM OF CANDY

1. Candies in general supply high caloric value in small bulk.

2. Sugar supplied by candy requires little digestive effort to yield available energy.

3. Those candies, in the manufacture of which milk, butter, eggs, fruits, nuts, or peanuts are used, to this extent also—

a) provide biologically adequate proteins and fats rich in the unsaturated fatty acids;

b) present appreciable amounts of the important minerals calcium, phosphorus, and iron;

c) contribute the niacin, and the small amounts of thiamine and riboflavin, contained in these ingredients.

4. Candies are of high satiety value; eaten after meals, they contribute to the sense of satisfaction and well-being a meal should bring; eaten in moderation between meals, they stave off hunger.

5. Candy is more than a mere source of nutriment—it is a morale builder, a contribution to the joy of living.

6. Candy is unique among all foods in that it shows relatively less tendency to undergo spoilage, chemical or bacterial.

This Platform is Acceptable for Advertising in the Publications of the American Medical Association

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SUCCESSFUL BURN THERAPY

IN THE MOST SEVERE CASES

FIRST PHOTO OF BURNED HANDS

SECOND PHOTO - TWO MONTHS LATER

THIRD PHOTO - TWO MONTHS LATER

Third degree burns, like the case shown, respond quickly to applications of Morco with Sulfathiazole.

This 65-year-old patient, severely burned in a flash explosion, was administered plasma and the burned areas treated with Morco with Sulfathiazole. In the case history, the attending physician states, "All the burned areas, including hands and face, healed with no evidence of infection. At the time of dismissal from the hospital, the scar formation was at a minimum, with no indication of permanent scars in these areas."

For burn therapy, Morco with Sulfathiazole has these advantages: cod liver oil, to stimulate granulation and epithelization; sulfathiazole, to inhibit sepsis; and benzocaine, acting as a local anaesthetic. The value of wool fat, phenol, boric acid and zinc oxide is well established.

In addition to the well proved therapy, an aromatic base in the preparation effectively neutralized the pungent odor of the second and third degree burns, making it unnecessary to isolate this type patient.

Morco with Sulfathiazole contains 65% cod liver oil U.S.P., sulfathiazole 5%, benzocaine 1%, wool fat, phenol, boric acid, zinc oxide and aromatics.

We will gladly send you a large sample of Morco with Sulfathiazole for your examination. Please state whether you want the two or four-ounce jar.

ARCHER-TAYLOR COMPANY

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FILLS IN THEIR VITAMIN GAP . . .

Efforts to correct the suboptimal vitamin intake of industrial workers frequently stumble over deep-rooted faulty eating habits, nutritionally detrimental cooking practices and dietary caprices. As an adjunct, to provide immediate dietary improvement, use

PAN-CONCEMIN
Brand of Polyvitamin
TABLETS

One small, easy-to-take Pan-Concemin Tablet, daily, fills the vitamin gap by supplying full therapeutic amounts of eight clinically important vitamins.

Vitamin A	5000 U.S.P. units
Vitamin B_1	3 milligrams
Vitamin B_2	2 milligrams
Vitamin C	40 milligrams
Vitamin D	800 U.S.P. units
Niacinamide	25 milligrams
Calcium d-Pantothenate	2 milligrams
Vitamin B_6	1 milligram

INEXPENSIVE Pan-Concemin Tablets are available to industrial physicians in stock packages of 1000 tablets or in individual dispensing units to suit any requirement. Employe groups can be given this high potency supplement at a cost of less than 2 cents a day per employe.

Write for sample, complete literature and specimens of promotional material supplied free as an aid to establishing a vitamin supplementation program in your organization.

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Wyeth
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➡ COMPLETELY ABSORBED BY MOUTH

➡ PERMITS PRECISE DOSAGE

PURODIGIN permits precise dosage based on weight, eliminating the uncertainty of doses based on different *units*.

DIGITOXIN is the only digitalis material known to be completely absorbed when given by mouth.

WYETH developed Purodigin to satisfy the need for a uniform, potent digitalis product for rapid digitalization by oral administration.

*Gold et al., J. Pharmacol. 82:187, 1944.

Supplied in vials of 30 scored tablets and bottles of 100, 0.2 mg. each

PURODIGIN

(DIGITOXIN)

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B R E C K

Breck Water Resistant Cream

Breck Water Resistant Cream forms a film of protective material which is resistant to the action of water and water soluble substances · Breck Water Resistant Cream has made many friends during the last year with both workers and management · This cream is designed to help protect the hands of workers who must work with their hands in water or must handle damp or wet materials · Breck Water Resistant Cream spreads easily and forms a very uniform film when applied to the hands and arms · It helps in the prevention of defatting of the skin · Breck Water Resistant Cream offers one more way to help workers keep their hands in the best possible condition

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Stimulating Response in Slow-Healing Wounds

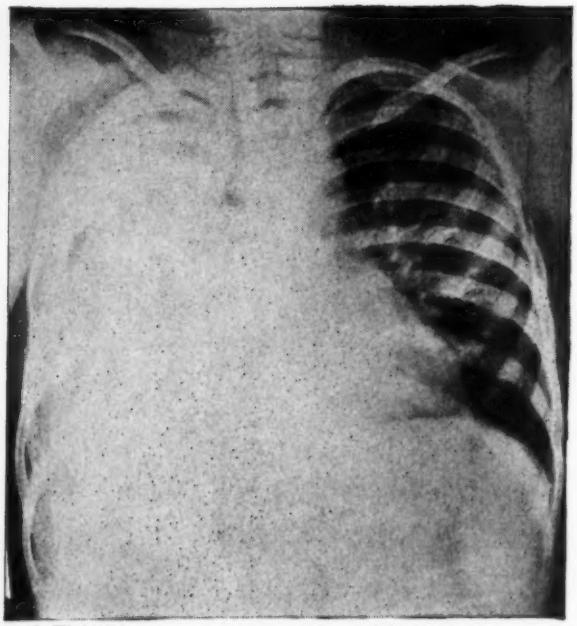
The significant measure of success which has attended the topical application of vitamins A and D in the treatment of surface burns, indolent ulcers and avulsive soft-tissue injuries has obtained for this type of therapy a wide and increasing acceptance.

White's
VITAMIN A AND D OINTMENT

presents these vitamins—derived from fish liver oils, in the same ratio as found in cod liver oil—in a bland lanolin-petrolatum base. Its use favors healthy granulation and rapid epithelization; it exerts a growth-promoting and stimulating effect upon both epithelial and connective tissue. It inhibits infection—minimizes skin grafting—forms no tenacious coagulum—destroys no epithelial elements—does not cause contractures.

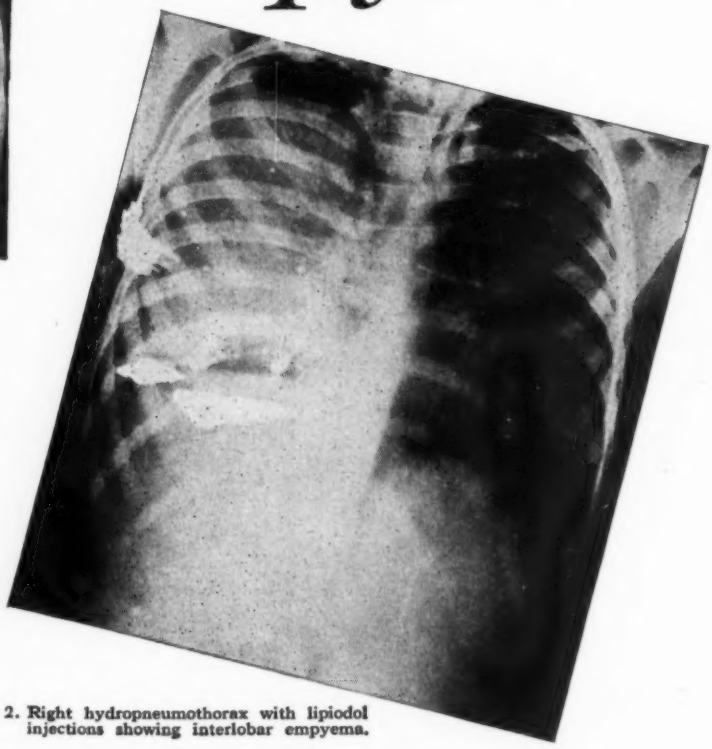
Free from objectionable odor and oiliness—keeps indefinitely at ordinary temperature. Available in 1.5 oz. tubes; 8 oz. and 16 oz. jars; 5 lb. containers. Ethically promoted—not advertised to the laity.

WHITE LABORATORIES, INC., ***Pharmaceutical Manufacturers***
NEWARK 2, NEW JERSEY



1. Right lobar pneumonia (type 1) and right empyema.

Penicillin in Empyema



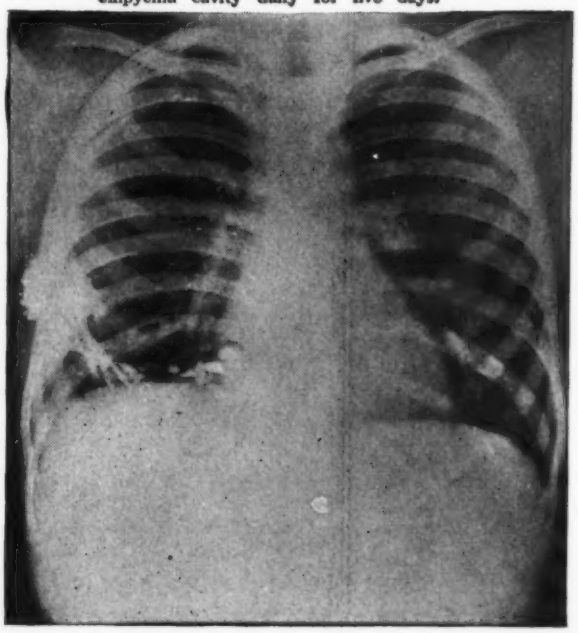
2. Right hydropneumothorax with lipiodol injections showing interlobar empyema.

Size of cavity, type of infection, and number of organisms determine the amount of penicillin to be administered in empyema. Usually 50,000 or 100,000 units in normal physiologic saline solution are injected once or twice daily directly into the empyema cavity after aspiration of pus or fluid. (Keefer, C. S.: New Dosage Forms of Penicillin, J.A.M.A. 128:1161 [Aug. 18] 1945.) Treatment is by instillation, rather than irrigation, because penicillin requires at least 6 to 8 hours of contact for maximum effect.

Bristol Penicillin, because of its freedom from toxicity and pyrogens, as well as absolute sterility and standard potency assures the desired pharmacologic action.

The rapidly developing new clinical uses of this potent antibiotic are abstracted in issues of the BRISTOL PENICILLIN DIGEST. If not receiving *your copies* regularly, write. Order Bristol Penicillin through your physicians' supply house.

3. After injecting Penicillin in saline into empyema cavity daily for five days.



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Formerly CHEPLIN LABORATORIES Inc.

SYRACUSE 1, N. Y.

from heavy to delicate suturing...

Surgeons employing the Singer Surgical Stitching Instrument find that its versatility in simplifying difficult suturing techniques heralds it as one of the most important contributions to modern surgery. With the advent of the new smaller "Model A-11", the adaptability of the instrument has been extended to cover the entire range of suturing requirements. • The Singer suturing instrument, for instance, utilizes needles up to the *largest size*, or down to the *smallest size practicable* in surgical work... permits the use of *a wide range of suture material*—fed from a continuous spool supply... *speeds* the execution of old familiar stitches... and provides for *new* suturing procedures as well.

SINGER SURGICAL STITCHING INSTRUMENT

Unites needle, holder, suture supply and severing edge in one, self-contained instrument, sterilizable as a complete unit.

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SINGER SEWING MACHINE COMPANY Q-105
Surgical Stitching Instrument Division
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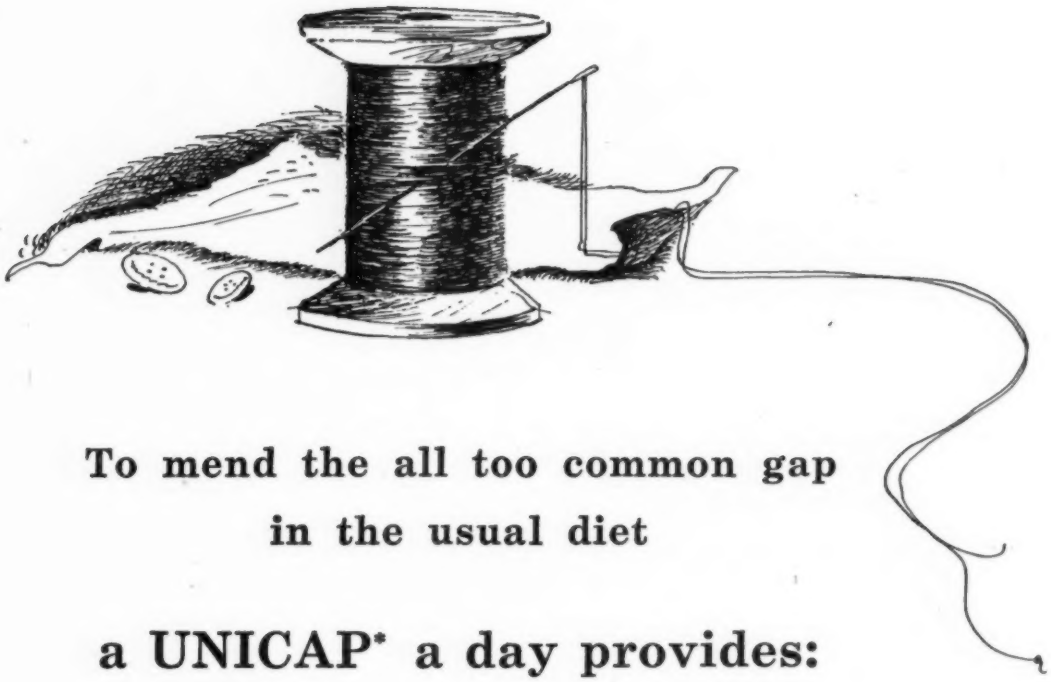

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a UNICAP* a day provides:

Vitamin A	5000 U.S.P. units
Vitamin D	500 U.S.P. units
Ascorbic Acid (Vitamin C)	37.5 mg.
Thiamine Hydrochloride (Vitamin B_1)	1.5 mg.
Riboflavin (Vitamin B_2, G)	2.0 mg.
Pyridoxine Hydrochloride (Vitamin B_6)	0.2 mg.
Calcium Pantothenate	1.0 mg.
Nicotinic Acid Amide (Nicotinamide)	20.0 mg.

AVAILABLE IN BOTTLES OF 24, 100, AND 250

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KALAMAZOO 99, MICHIGAN

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The whirlpool bath is indicated for the treatment of painful stumps after amputation; painful and adherent scars; purulent wounds; indolent ulcers; acute arthritis; post-operative fractures of the extremities; and inflammations of joints, muscles and tendons of the extremities.*

*Handbook of Physical Medicine of the American Medical Association, page 169.

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The Rocke Hydrotherapy Bath is a new and efficient device for administering whirlpool bath treatments. It combines the production of hyperemia, with the massaging action of aerated water. An impeller at the bottom of the tank assures vigorous agitation of the water supplemented by aeration through the air-intake tube. Thus, a vertical massaging action is produced.

This bath is mobile, compact, self-contained—easily filled or drained, yet no permanent plumbing connections are required. However, if desired, permanent installation is possible with a minimum amount of plumbing.

For complete information, write General Electric X-Ray Corporation, 175 West Jackson Boulevard, Chicago 4, Illinois, Dept. D110.

Accepted by the Council on Physical Medicine, American Medical Association.

1895 OUR FIFTIETH YEAR OF SERVICE 1945

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Back on the job, the ambulant peptic ulcer patient requires a quick, dependable, conveniently administered means of controlling gastric distress. In relying on 'GELUSIL'* Antacid Adsorbent Tablets, he obtains not only immediate relief, but, equally as important, sustained relief with unimpeded healing processes. Again, therapy with 'GELUSIL' Antacid Adsorbent Tablets need rarely be interrupted since this combination of a uniquely acid-resistant alumina gel with magnesium trisilicate is essentially free of the constipating action frequently associated with ordinary aluminum hydroxide preparations.

'GELUSIL' Antacid Adsorbent Tablets do more than keep the patient on the job—they enable him to function on an optimal level of efficiency. In bottles of 50, 100 and 1000 tablets; and as a fluid gel in bottles of 6 and 12 fluidounces.

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'gelusil' *antacid adsorbent*

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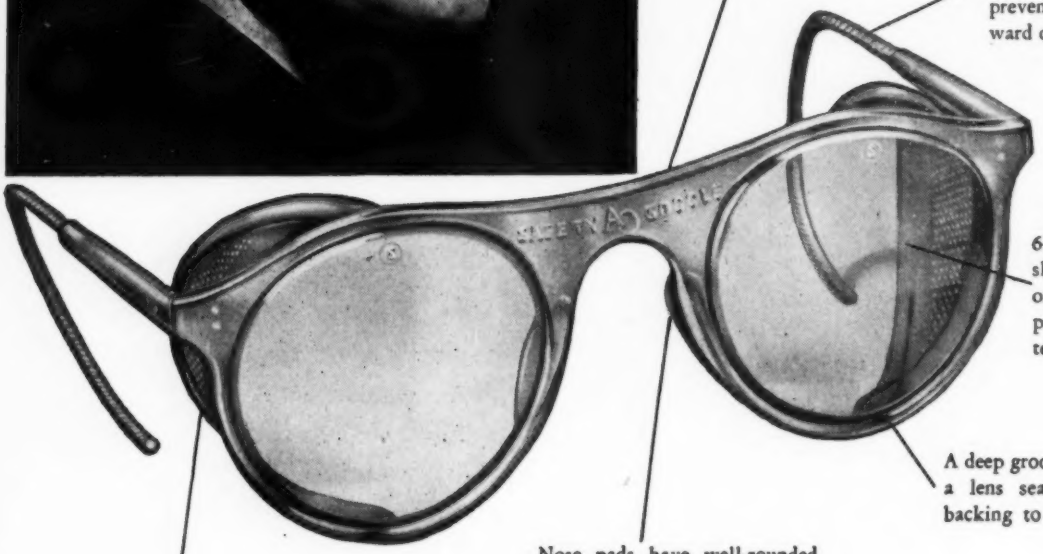
6 FEATURES make AO FUL-VUE ACETATE GOGGLES..... SAFE, COMFORTABLE, ATTRACTIVE



Stronger, more sturdy front than on ordinary acetate frames. Bridge has a slight amount of face form to give added side protection.

Comfort cable temples hold goggles snugly in position—prevent them from sliding forward on nose.

6-curve Super Armorplate lenses shaped to conform to and cover orbit of eye, provide maximum protection and vision, plus better appearance.

A deep groove in lens rim forms a lens seat with substantial backing to resist *severe* impact.

Nose pads have well-rounded edges and ample flare to withstand ordinary jolts and blows.

Acetate side shields protect against particles striking from sides. Perforated to provide ventilation and help keep lenses from fogging.

AO Ful-Vue Acetate Goggles come in three eye sizes and three bridge sizes—made in transparent acetate, with or without side shields, with clear or Calobar 6-curve Super Armorplate lenses. Your nearest AO Representative can supply you. Call him today.

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COMPANY
SOUTHBRIDGE, MASSACHUSETTS

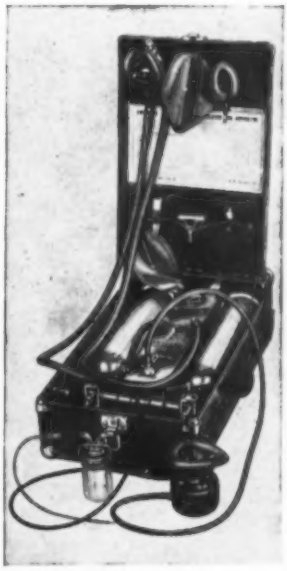
℞ for Conversion
Combat Asphyxial Death!

This is best done with the aid of the—

EMERSON RESUSCITATOR

Under the impetus of war, great strides have been made by industry and the armed forces in the use of automatic resuscitation equipment. Apparatus and techniques have been improved, so that today, unnecessary asphyxial death has almost become a thing of the past. In this development, the Emerson Resuscitator, Aspirator and Inhalator has played a leading role.

It will continue to do so as industry converts from war to peace, because of the continuing emphasis on preventing asphyxial death or loss of time from asphyxial accidents.



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AN INTEGRAL PART OF THE

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ETHICALLY PROMOTED

ERTRON THERAPY now occupies a position of established importance among the measures routinely considered in the management of arthritis.

The cumulative evidence of several years in many series of cases reveals that Ertron therapy is followed by definite subjective and objective improvement in a high percentage of arthritic patients.

Objective improvement is manifest in decreased pain and soft tissue swelling. There is measurable increase in muscular strength and joint motility.

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The bibliographic background of Ertron is sufficient warrant of both its therapeutic efficacy and safety, when used according to established procedure. It is worthy of note that the reports in the literature refer only to Ertron, the product used in these clinical studies.

Ertron alone—and no other product—contains electrically activated vaporized ergosterol (Whittier Process).

Ertron is the registered trade-mark of Nutrition Research Laboratories

ERTRON PARENTERAL

For the physician who wishes to reinforce the routine oral administration of Ertron by intramuscular injection, Ertron Parenteral is available in

packages of six 1cc. ampules. Each ampule contains 500,000 U. S. P. units of electrically activated vaporized ergosterol (Whittier Process).

Supplied in Bottles of 50, 100 and 500 capsules

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THE BLADE THAT SKILLED HANDS DESERVE!

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Available in 9 Sizes to Fit All Standard Surgical Handles

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Surgeon's Blades and Handles

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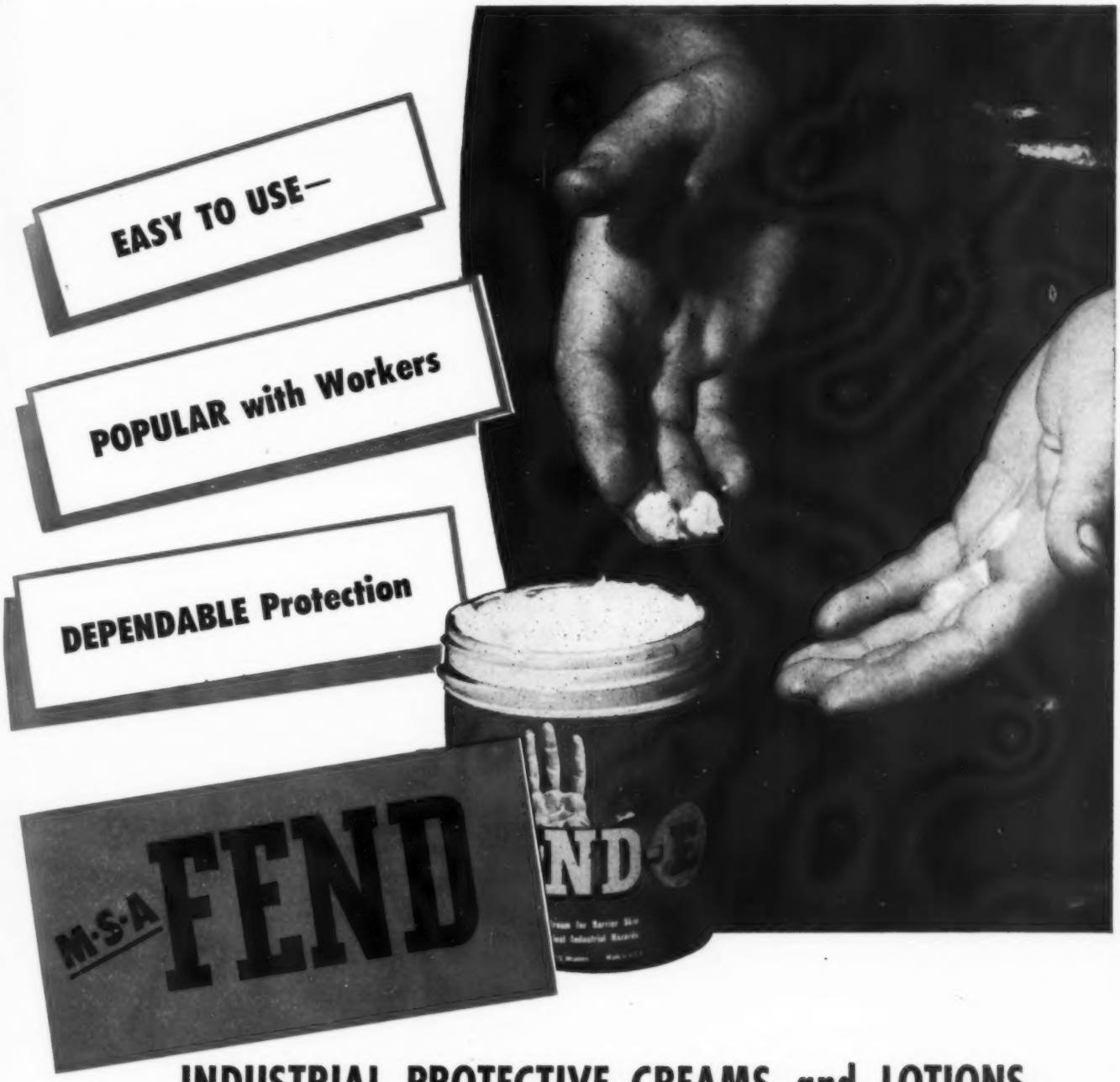
Makers of fine edges for over half a century



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Each Fend Cream and Lotion incorporates all the basic advantages which appeal to workers. These are the *protective value* of Fend, the light texture and clean fragrance which make Fend pleasant to use, and its long-lasting effective barrier during the work period. Each Fend formula is *bland and neutral* in composition, emollient, non-irritating, harmless to the most sensitive skin. The user finds Fend products *easy to apply;* Fend rubs in quickly, and is *readily removed* when work is finished with mild soap and warm water.

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HOW TO PROTECT *These Hands* AGAINST IRRITATION

Interesting experiment discovers easy way to help guard hands.

THE EXPERIMENT

A large number of subjects placed their hands in strong, hot, alkaline solutions. One hand was unprotected; the other was guarded by TRUSHAY *before* immersion.

RESULTS

After repeated exposure, the unprotected hand lost much of the natural skin lubricant . . . became rough and cracked.

But in most cases the TRUSHAY-guarded hand remained soft and smooth!

TRUSHAY PROTECTS HANDS

Unbroken skin provides an effective barrier against harmful bacteria. But when concentrated solutions, dirt and grime cause tiny cracks and fissures in the hands, bacteria swarm in. *TRUSHAY guards against this by helping to keep skin normal and unbroken!*

TRUSHAY is economical; just a few drops are enough for both hands. Employees will appreciate your suggestion of TRUSHAY-protection.

Trushay

THE "BEFOREHAND" LOTION

A Product of BRISTOL-MYERS COMPANY

19NE W. 50TH STREET, NEW YORK 20, N. Y.

"The local care of the burn should start THE INSTANT the burn occurs . . ."

—Caulfield, P. A.: Therapy of Burns, Med. Annals of the District of Columbia, 13:251-253 (July) 1944.

FOILLE

applied as soon as possible to the burned surface quickly provides a measure of *relief from pain*—thereby aiding materially in mitigating the potentially serious element of shock.

Foille provides several "Plus Factors" in local burn management.

In actual practice, Foille is adapted to the same treatment methods—pressure dressings, for example—as apply to bland ointments, but in addition Foille is so chemically balanced in formula that it offers these desirable "plus" clinical advantages:

- **Consistently avoids sepsis**
- **Markedly controls pain**
- **Stimulates quick granulation**

FOILLE EMULSION... 5 gallons, gallons, quarts, pints, 4-oz., 2-oz. bottles.

FOILLE OINTMENT... Stable, *all* vegetable oils base—6 lb., 1 lb. jars.

Write to us for sample of New Foille Ointment

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pHīsoderm

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THE MODERN SYNTHETIC SUDSING DETERGENT

Is extremely surface-active . . . Reposits an emollient film

The product and its suds have a

pH VALUE ON A PARITY WITH

the average of normal skin

pHĪSODERM is a cream which, when worked with water in the usual way, produces copious and emollient suds.

pHĪSODERM is particularly efficacious as a surgical scrub as it is approximately 40% more surface-active than soap and speedier in action.

pHĪSODERM is active at any temperature in any type of water—soft, hard or even sea water—and under acid, alkaline or neutral conditions.

pHĪSODERM contains no soap, fatty acids or alkalis.

HOW SUPPLIED: 2 oz. bottle, 8 oz. bottle, and 3 oz. special dispenser.

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NEW YORK 13, N. Y.

BECAUSE delicate and hard-to-replace instruments deserve it... and aseptic technic demands it...

BARD-PARKER FORMALDEHYDE GERMICIDE

combines both requisite properties

First...

and most essential, this widely employed medium combines both germicidal and sporicidal potency. Unexcelled for use with precision steel instruments and keen cutting edges. Knife blades covered with a dried blood contamination of *Staph. aureus* are consistently disinfected within 2 minutes. Within 1 hour the spores of *B. anthrasis,* and within 4 hours the spores of *Cl. welchii* are destroyed. Even the extremely resistant spores of *Cl. tetani* are killed within 18 hours. To insure the destruction of all forms of pathogenes, instruments should remain immersed in the Solution for at least 18 hours.

Secondly...

and of budget-conserving importance, the Solution is designed to safeguard the factory-new qualities of metal instruments, glass and heat treated rubber. It is non-injurious to keen cutting edges of surgical blades and scissor edges. Prolonged immersion will not result in rust or corrosive damage . . . a valuable aid in reducing replacement expense to a minimum.

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especially designed for small instruments, suture tube storage, suspended immersion of surgical blades, are recommended for convenient and practical use with the Solution.

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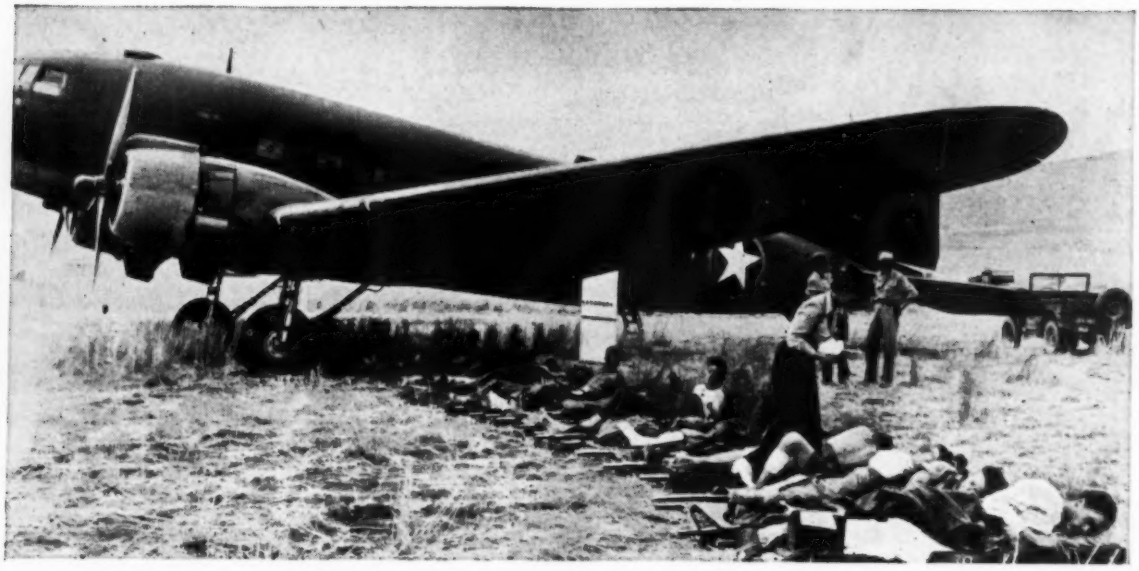

This, too, will be written in history

Among the many brilliant originations, the inspired improvisations, of the Medical Corps in World War II was the use of the "ambulance on wings."

When the photograph above was taken, the casualties lined up had *just been wounded!* Already they had been given emergency medical aid, and in a matter of *minutes* were on their way to a base hospital with complete facilities far away from the combat zone . . . Thanks to such immediate surgical care, quick hospitalization, and all the companion advancements of wartime medical science, 97 out of every 100 such casualties *lived!*

Thanks should be proffered most generously to the incredible diligence of those "soldiers in white" who created and tirelessly practiced these techniques—the medical men in the service whose rest all too often was no more than a moment and a cigarette. Incidentally, that cigarette was very likely a Camel, an especial favorite of all fighting men.

R. J. Reynolds Tobacco Company, Winston-Salem, North Carolina

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FOR

PROPHYLAXIS AND THERAPY OF MULTIPLE VITAMIN DEFICIENCY

EACH PELLET CONTAINS

Vitamin A From fish liver oil	5000 U.S.P. units
Vitamin B_1 Thiamine Hydrochloride	2 mg.
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Calcium Pantothenate	1 mg.
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Vitamin D Chemically pure synthetic vitamin D_2 (calciferol) from ergosterol	1000 U.S.P. units

8 VITAMINS

PLURAVIT... Brand of MULTIPLE VITAMINS

• • SMALL, EASY TO SWALLOW, PLEASANT TASTING PELLETS, WITHOUT AFTER-TASTE.

WINTHROP CHEMICAL COMPANY, INC.
PHARMACEUTICALS OF MERIT FOR THE PHYSICIAN
NEW YORK 13, N. Y. WINDSOR, ONT.

Which?

Equally convenient, yes. But ALUMINOID Capsules demonstrate a wide range of effectiveness over the tablet form of aluminum hydroxide commonly used toda-

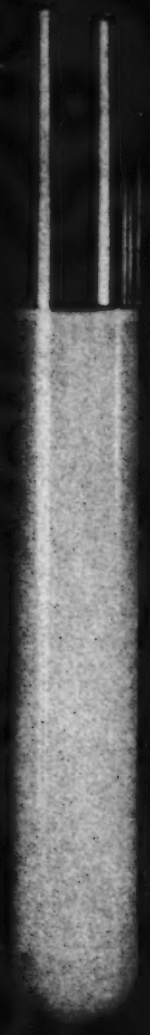
Why?

ALUMINOID is colloidal aluminum hydroxide in powdered form which immediately peptizes in N/10 hydrochloric acid to form a very fluid opalescent sol of colloidal alumina, the particle size of which is so fine that the resultant sol is stable for weeks and months. This sol will pass through fine filter paper.

It is generally recognized that true colloidal properties are of primary importance for prompt and prolonged relief in the treatment of peptic ulcer and gastric hyperacidity. Illustrated here is a simple experiment which any physician may make. It demonstrates clearly the true colloidal properties of ALUMINOID and the non-colloidality of the average tablet form.

Further, ALUMINOID neutralizes physically the HCl through surface adsorption which action tends to reduce the constipation often produced by aluminum hydroxide therapy.

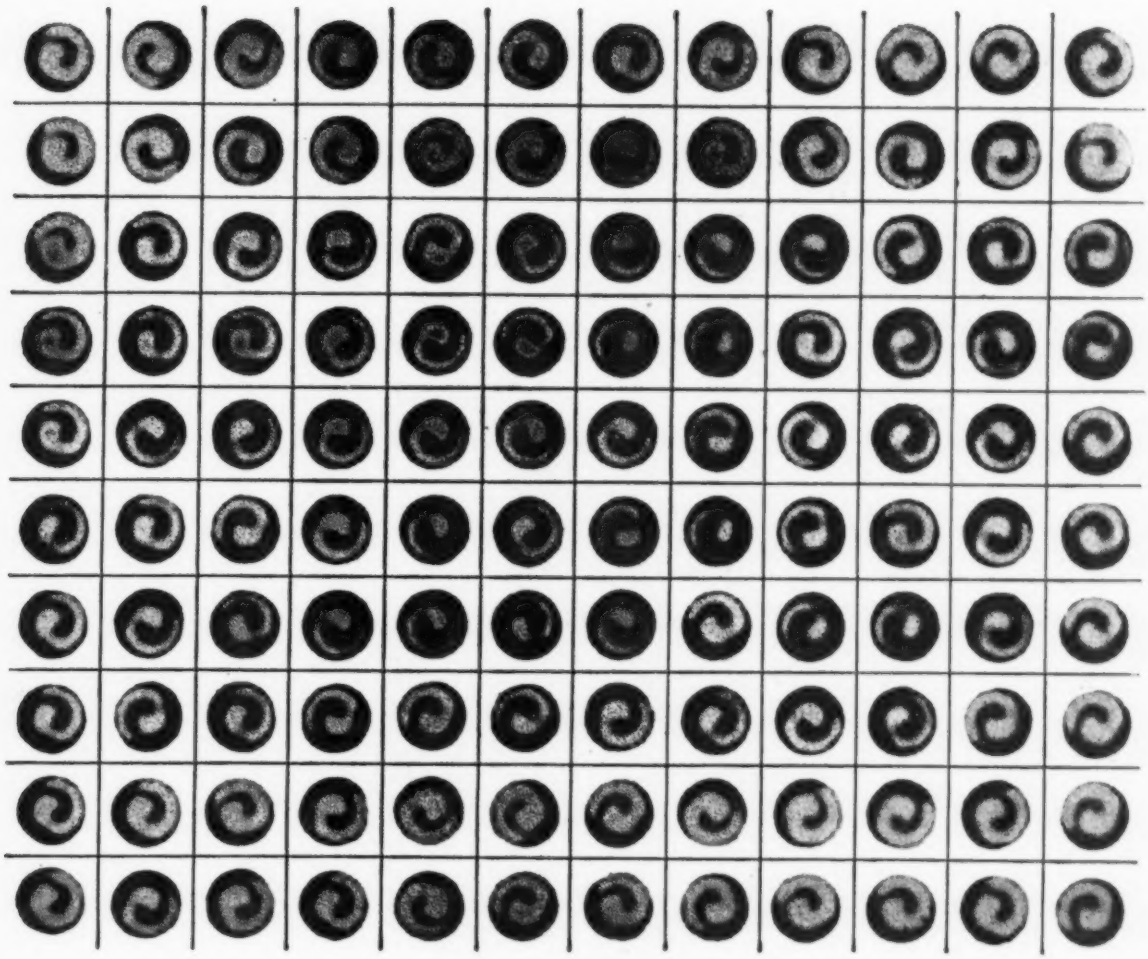
Drop tablet of alumina hydrate in tube of N/10 HCl, mash and stir thoroughly. Note that it does not disperse and goes quickly to bottom of tube.



Empty a capsule of **ALUMINOID** into a tube of N/10 HCl, and stir thoroughly. Note the resulting stable colloidal sol showing a complete dispersion.

Chatham

CHATHAM PHARMACEUTICALS INC.



a normal R.B.C. lives 120 days*

Although the four month span of the normal erythrocyte may be considerably shortened during anemic states, the physician can lengthen this pathologically curtailed life by appropriate therapy. 'Tabloid' 'Ferad' No. 2, a clinically proved agent for the treatment of iron-deficiency anemias, contains the most effective therapeutic form of iron—ferrous sulfate (Ferrous Sulfate, Anhydrous gr. 2-3/5) combined with enough sodium carbonate (Sodium Carbonate, Anhydrous gr. 1-4/5) to assure optimal gastric tolerance.

*Callender, S. T. J. Path. & Bact. 57:129, January 1945

'Tabloid' 'FERAD' No. 2

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Doctor: We want you to taste this palatable soda tablet

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ONE HUNDRED TABLETS
SIX GRAIN
CARBEX BELL
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Sodium Bicarbonate, Ginger and Aromatics
PROPERTIES: Antacid, Anti-Flatulent, Carminative.
DOSE: Two to five tablets dissolved in the mouth or in severe cases in glass of hot water.
Hollings-Smith Co.
Manufacturing Chemists
ORANGEBURG, NEW YORK, U. S. A.

"Trial is Proof"

Carbex Bell is made entirely of sodium bicarbonate and aromatics because our doctors tell us that sodium bicarbonate properly used is the fastest-acting and most dependable relief known for the symptoms of indigestion.

The candy-tasting alkalizer

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There is only one way in which any therapy can "hit the mark" in psoriasis. *That way is to clear the patches.*

RIASOL's clinical success in psoriasis is the reason why thousands of doctors are prescribing it.

RIASOL's success where other therapies have failed is a good reason for *starting* treatment with Riasol.

RIASOL contains 0.45% mercury chemically combined with soaps, 0.5% phenol and 0.75% cresol in a washable, non-staining, odorless vehicle.

Apply RIASOL daily after a mild soap bath and thorough drying. A thin, invisible, economical film suffices. No bandages needed. After one week adjust to the patient's progress. RIASOL is safe to use on any area, including face and scalp.

RIASOL is not advertised to the laity. Supplied in 4 and 8 fld. oz. bottles, at pharmacies or direct.

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After Using RIASOL

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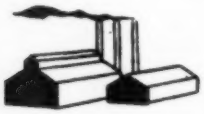
RIASOL for PSORIASIS

In the first-aid stations and medical departments of large  and small industrial plants, 'B·F·I' has become a "must"--for it is so convenient, handy and ready for immediate use in the treatment of cuts, abrasions, burns, chafing, scratches and other minor wounds and skin irritations. Dusted on liberally, 'B·F·I' brings almost immediate relief to tired, burning, weary feet, and is of proven value in the treatment of epidermophytosis (athlete's foot). It promotes healing without caking or forming hard crusts--an ideal antiseptic, dry, surgical dressing. 'B·F·I' Powder is supplied for "industrial use" in a ½ pound combination sprinkler-top and dispensing package. Also available in ¼ ounce and 1¼ ounce sprinkler-top packages.

Sharp & Dohme, Philadelphia 1, Pa.

B·F·I POWDER

ANTISEPTIC FIRST-AID DRESSING AND SURGICAL POWDER

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EMAGRIN

FOR THE RELIEF OF PAIN

EMAGRIN is an analgesic and antipyretic tablet employed to reduce the pain or fever caused by simple headaches, neuralgias, and common colds. It minimizes muscular and menstrual aches and pains, as well as many other discomforts. Users of EMAGRIN consider it superior to aspirin for these purposes, an opinion resulting from most satisfactory use for over 25 years, the lifetime of the product.

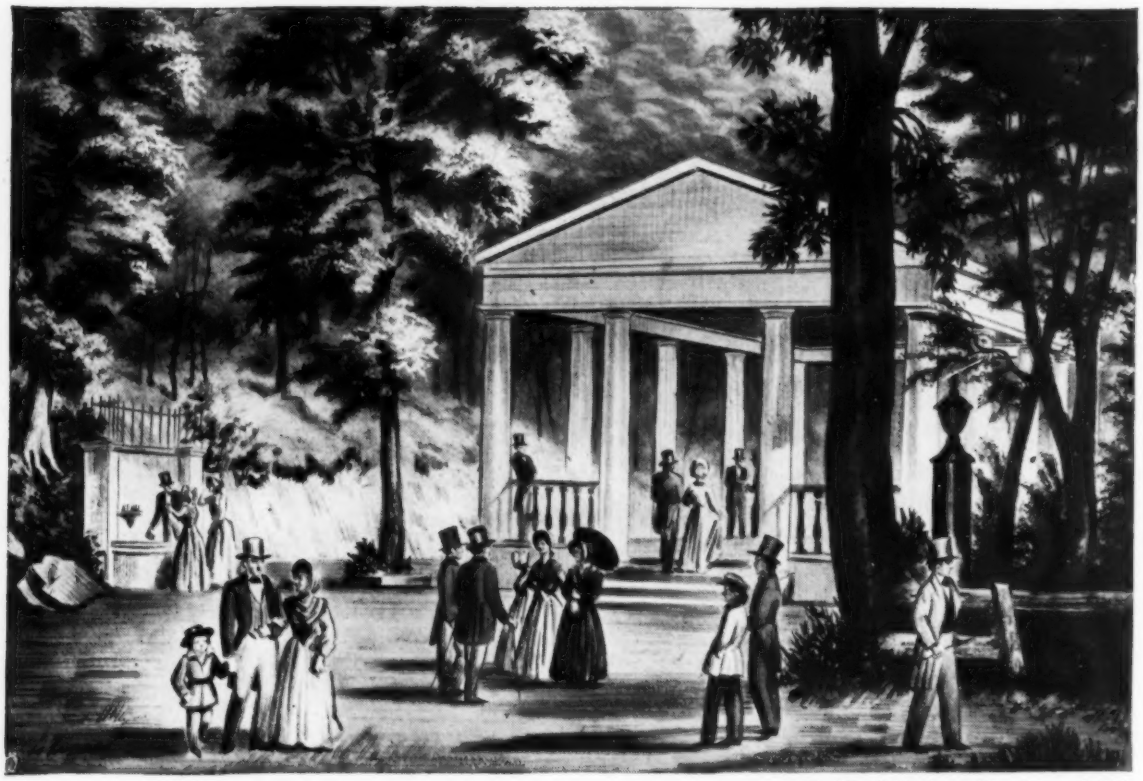
The enhanced efficacy of EMAGRIN is attributable to the balanced, cooperative action of its four ingredients — acetylsalicylic acid, acetophenetidin, caffeine, and tincture of gelsemium — in promoting the desirable functions of each.

Physicians recommend it and find it highly acceptable to the patient. Its industrial use in plant, factory and office ever increases as its merits become more widely known. It is supplied in convenient quantities of from 12 to 5,000 tablets.

Complete information with sample upon request. Use as directed on the label.

Otis Clapp & Son Inc.

BOSTON 16, MASSACHUSETTS



Bedford Springs, Pa. (circa 1850)

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Since Bedford Springs were discovered in 1804, thousands of patients have visited this world-famous Spa. Today, your patients can enjoy, at home, one feature which attracts many to Spas all over the world — a sparkling saline laxative.

Analyses of the waters of many Spas indicate that sodium sulfate, sodium chloride, and sodium bicarbonate are often the most important ingredients. These same salts are scientifically combined with sodium phosphate, lithium carbonate, and tartaric acid in pleasant-tasting SAL HEPATICA—providing a gentle, effective method of cleansing the intestinal tract.

For a gentle, more efficient laxative, or thorough cathartic—direct your patients to dissolve SAL HEPATICA *in a large glass (8 oz.) of water. Laxative Dose: 1 to 2 level tsps. Cathartic Dose: 4 level tsps.*

A Product of Bristol-Myers Company, 19XX West 50th Street, New York 20, N. Y.

TO HELP FLUSH THE INTESTINAL TRACT

Sal Hepatica SUPPLIES **Liquid Bulk!**

PROTECT your workers with these 2 hand creams

—made by Du Pont

You can now supply your workers with two types of PRO-TEK—and meet almost every requirement for a hand protective cream.

The standard PRO-TEK is not affected by grime, paints, solvents and insoluble oils, but washes off quickly with soap and water. PRO-TEK No. 2 resists water-mixed cutting oils, mild acids, alkalies and other aqueous solutions.

Both types of PRO-TEK are applied before starting work. They are safe, sanitary and easy to use. Both are extensively used in many large factories, and are recommended by safety engineers and plant hygienists.

If you're not already using these outstanding hand protective creams, ask your jobber about them—or write direct for free samples to E. I. du Pont de Nemours & Co. (Inc.), Dept. IM-5, Wilmington 98, Delaware.

DU PONT PRO-TEK

REG. U. S. PAT. OFF.

HAND PROTECTIVE CREAM

AIR DISINFECTION

. . . as timely as water purification

HYGEAIRE Units . . .

potent destroyers of air-borne bacteria and viruses, effectively reduce contamination of air at a rate far greater than any method of mechanical ventilation extant.

This *Protective* measure can be of inestimable value in industrial plants, schools and business offices—wherever common occupancy of enclosed spaces exist. The germ-killing ultraviolet capacity of Hygeaire is equivalent to from 100 to 500 air changes per hour, predicated upon a ratio of units installed to the area to be irradiated . . . an efficiency far in excess of established requirements.

Analyze this efficiency-economy rating—

Over 85% of the ultraviolet energy output is within the germicidal range.

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Bacteria-killing potency in the zone of irradiation is effective at distances as great as 35 feet from the unit.

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Permanently set baffle confines powerful beam to the area above the normal line of vision. Non-distractive visible light output and protection of room occupants against direct exposure.

•

Tube efficiency guaranteed for an average of 4000 hours of continuous operation. Actually 166 days—24 hours a day.

•

Surprisingly low initial cost. Lamp replacement and electricity expense averages less than 3¢ per day . . . less than a suitable reading bulb.

Note!
Thermal circulation is sufficient to convey air-borne bacteria within the disinfecting field where they are rapidly destroyed.

Investigate this health conserving equipment • Ask your dealer or write us direct

AMERICAN STERILIZER COMPANY

Erie, Pennsylvania

DESIGNERS AND MANUFACTURERS OF SURGICAL STERILIZERS, TABLES AND LIGHTS

A HELPFUL CONVALESCENT AID...

THE AMERICAN-COMPER Invalid and Orthopedic WALKER

OF RECOGNIZED clinical and economic value in orthopedic, fracture, paralytic and post-operative cases at the time convalescent progress permits placement on ambulatory service.

1. Tends to overcome fear psychosis in patients . . . inspires confidence against tripping or falling.

2. Assures stabilized weight distribution with smooth ambulatory motion.

3. Affords free application of leg exercises and encourages general muscular development.

4. Provides against patient collapsing to the floor in the event of strength failure in hands or arms.

5. Adjustable for height of armpits, normal grip extension and varying widths of shoulders.

6. Available in both adults and child sizes.

WRITE TODAY for descriptive literature

AMERICAN STERILIZER COMPANY

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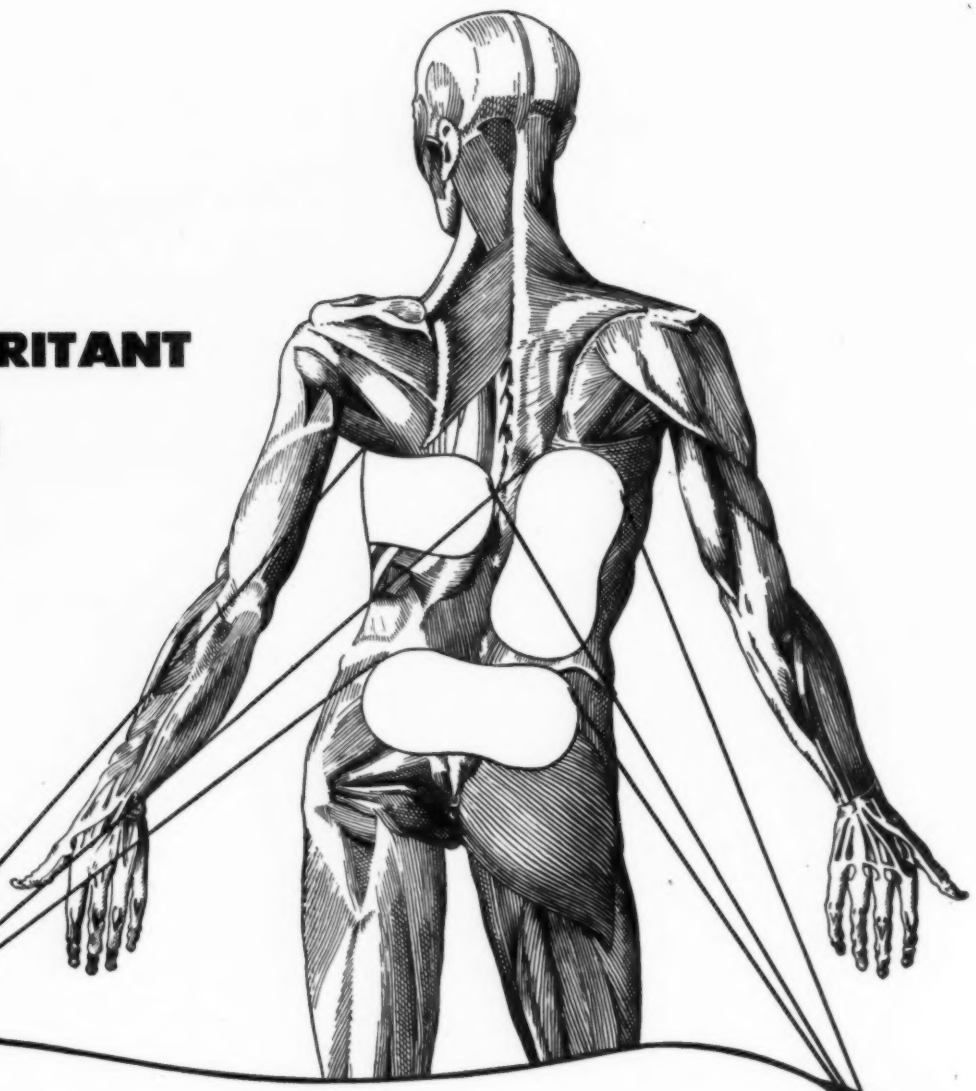
DESIGNERS AND MANUFACTURERS OF SURGICAL STERILIZERS, TABLES AND LIGHTS

A SAFE COUNTER-IRRITANT FOR SIMPLE BACKACHE



• In cases of simple muscle pain, soreness, stiffness or fatigue, Johnson's BACK PLASTERS are a convenient agent for continuous counter-irritation, support and protection against chilling. Their primary effect is simple, direct and desirable. The plaster's mild counter-irritant, held on warm flannel, causes local and reflex hyperemia—relieving congestion, easing muscle pain and assisting natural body processes.

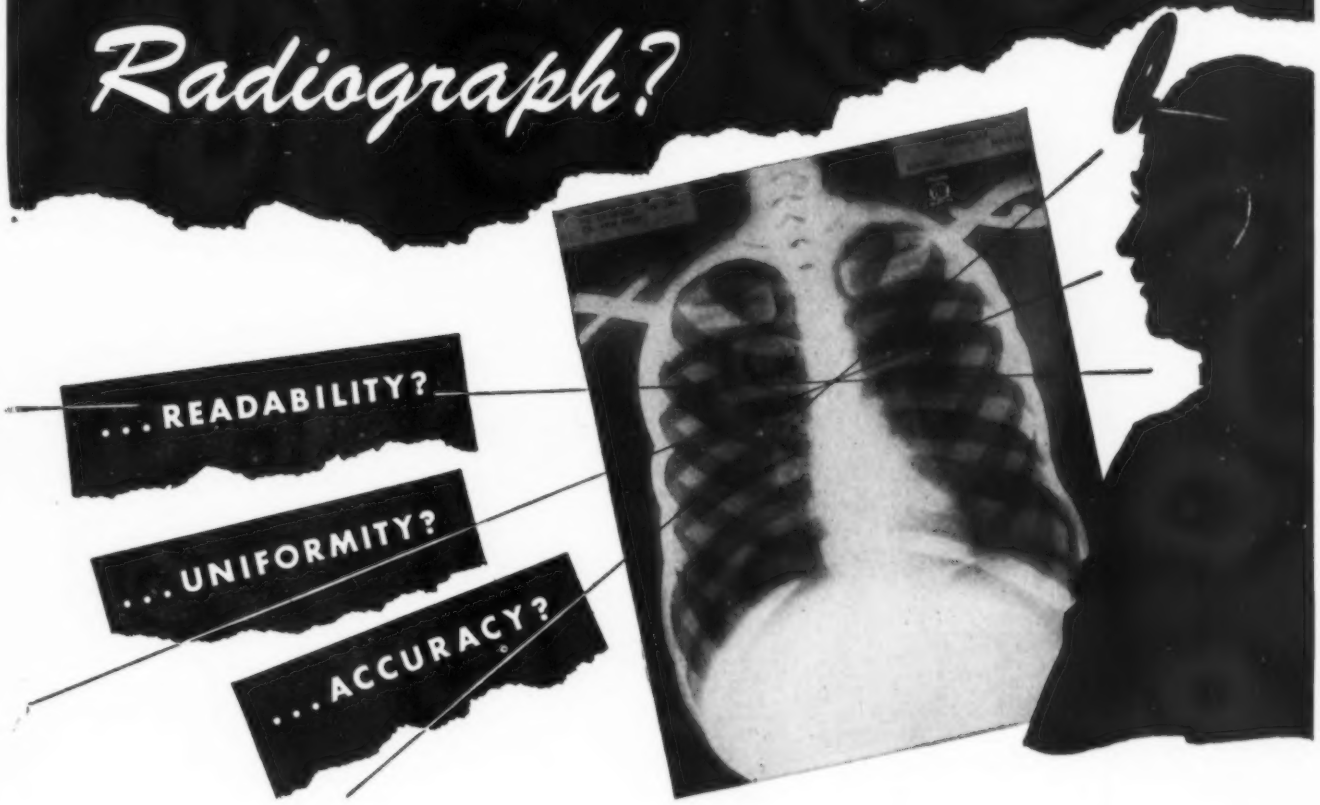
• Results are immediate and prolonged—one plaster may remain in place for several days, exerting its *continuous* heating, protective and pain-relieving effect. More and more physicians use this tested aid where patients require additional splinting and warming action in post-treatment exposure.

• *Write for liberal free supply of Johnson's* BACK PLASTERS *and* BELLADONNA PLASTERS. *Both are worthy of increased clinical attention.*

JOHNSON & JOHNSON • New Brunswick, N. J.

Johnson's **BACK PLASTER**

What do you look for in a Radiograph?



THESE considerations are especially important to the physician whether he is interpreting *one* radiograph or a large number of *survey* X-Rays.

That's why Powers X-Ray Service, in conducting group chest examinations for the past twelve years has standardized on *full-size* 14" x 17" radiographs. Within the limitations of speed and economy imposed by survey conditions, we believe these radiographs fulfill the physician's most important requirements for fast, accurate diagnosis. Powers Radiographs feature:

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POWERS X-RAY SERVICE is available anywhere in the United States for large-scale examinations. Interested physicians are invited to write for further details to:

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GLEN COVE, L. I., N. Y. *Group Radiography*

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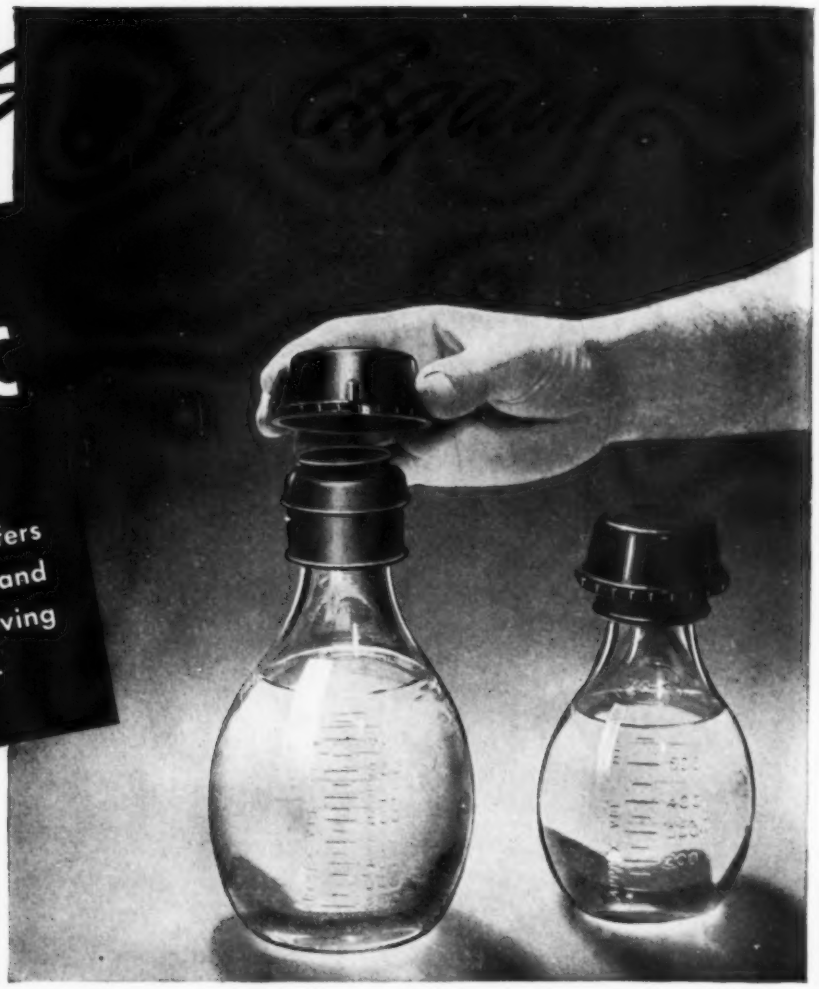
A dual-function closure that offers unprecedented convenience and safety in handling and conserving surgical fluids in the hospital.



POUR-O-VAC seals are reusable . . . may be sterilized repeatedly.

Will fit Fenwal 500, 1000, 2000 and 3000 ml. containers.

Fenwal

ADVANTAGES IMPORTANT TO EVERY HOSPITAL . . .

The Pour-O-Vac seal is a practical hermetic closure which permits storage of sterile fluids for long periods. Sterility may be constantly determined by the audible "water-hammer" signal.

The flaring upper lip of the collar facilitates pouring solutions directly from the original container without danger of contamination by contact with parts of the collar which are not within the sterile area of the closure. Contents will pour freely and without drip.

Serves as an efficient dust-tight seal when total contents of container are not used ▲ Eliminates waste of contents ▲ Saves time in sealing ▲ Eliminates use of cotton, gauze, string, paper, tape ▲ Markedly reduces possibility of breakage or damage to lips of containers.

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MACALASTER BICKNELL COMPANY

243 Broadway Cambridge, Massachusetts

Heat...the Healer

....Efficiently and Economically Applied

The capacity of infra-red rays for penetrating tissue and there inducing heat, thus encouraging blood circulation, relaxing muscle tension, and relieving pain, make their use a routine reliance in a variety of conditions involving congestion and inflammation.

The Burdick

Z-15 Dual Zoalite

provides infra-red ray therapy with a degree of clinical efficacy combined with economy of means and effort on the part of the operator which constitute real efficiency.

The Burdick Dual Zoalite is equipped with a double head—a 475 watt unit for general irradiation, and a 75 watt "localizer" providing penetrating infra-red evenly over a 3½ inch area at 8 to 12 inch distance.

To thousands of physicians in institutional and private practice, the name "Burdick" carries its own assurance of sound engineering and dependable performance.

Detailed information sent on request.

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The BURDICK CORPORATION
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A POTENT HEMOSTATIC FOR LOCAL USE

Long awaited by physicians and surgeons, highly purified ***thrombin***, nature's own hemostatic, is now available in sufficient quantity to permit us to introduce

THROMBIN TOPICAL

Acting directly on the fibrinogen of the blood . . . virtually independent of other clotting factors, such as calcium ions, thromboplastin, prothrombin, and vitamin K . . . THROMBIN, TOPICAL (bovine origin) produces hemostasis in a matter of seconds. In the control of capillary bleeding it is applied in solution in isotonic saline, sprayed or flooded over the bleeding surface.

As its name indicates, THROMBIN, TOPICAL, *must not be injected.*

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Parke, Davis & Company

DETROIT 32 • MICHIGAN

This magazine is published to promote sound thought upon and concerning industrial medicine and traumatic surgery. To that end it will contain articles, news items, reports, digests, and other presentations, together with editors' comments. The editorial policy is to encourage frank discussion. On this basis contributions are invited.

Industrial Medicine

Reg. U. S. Pat. Off.

The editors will exercise care in checking on the accuracy of data printed, but in all other respects articles and opinions of which expression is allowed are the opinions of their authors—the editors reserving in all cases the right to comment on the same, in the current or any subsequent issues, as they may be inclined.

The Journal of Industrial Health, Occupational Medicine and Traumatic Surgery

With which are consolidated "The Industrial Doctor" and "International Journal of Medicine and Surgery."

The Science, the Law and the Economics of Industrial Health

Volume 14 October, 1945 Number 10

The Medical and Environmental Control of Health Hazards in Aircraft Assembly Plants

EUGENE B. LEY, Major, M.C.,
FREDERICK J. VINTINNER, Captain, SnC.,
Medical Service, Headquarters Eighth Service Command,
Dallas, Texas

MANY processes and operations in the assembly of aircraft involve exposure of workers to chemicals and other materials which are potentially injurious to health. While the processes and materials vary in different plants, depending largely upon the type of plane assembled and extent to which plane parts are manufactured, the following discussion deals with some of the more common health hazards and the medical and environmental control measures necessary to minimize or eliminate harmful occupational exposure.

Handling Duraluminum

STOCK duraluminum, magnesium alloy and other metals are often coated with resins, oils (fish oils), or zinc chromate as protective agents. These preservatives may cause dermatitis in some individuals due to the sensitization or primary irritant action. Sensitive individuals should be transferred from contact. Protection consists of providing the employees with protective gloves and clothing to prevent skin contact with the material.

Pattern Shop

NUISANCE dust created from wood working equipment such as power saws and belt and disc sanders are irritating to the eyes and nasal mucous membrane and should be controlled with local exhaust ventilation.

Mahogany, laminated and formed phenolic materials, and certain glues may irritate the sensitive skin. Protective clothing and gloves aid in preventing contact with these materials. Individuals showing persistent skin sensitivity should be removed from exposure.

The making of plaster patterns requires the employees to be in contact with certain materials such as kerosine, beeswax, sulphuric acid, stearic acid, and sulphur compounds which may cause dermatitis among some of the employees. The use of impervious gloves and long sleeves will prevent contact of these materials with the hands and arms.

Spray coating of the patterns is sometimes performed in these departments. This should be done within an adequately exhausted paint spray booth. Methyl alcohol is frequently used as a thinner for shellac. This practice should be discouraged. One of the less toxic synthetic alcohols (e.g., isopropyl) should be substituted when practical. If excessive dust is created from the mechanical forming and buffing of the patterns, proper dust control measures should be inaugurated.

Foundry

HEALTH hazards in the foundry include exposure to lead, zinc and various gases. Kirksite and Dierite are commercial alloys consisting principally of zinc which is much less hazardous than lead. However, since zinc oxide fumes are capable of causing metal fume fever, excessive exposure to zinc fumes must be avoided. Lead and zinc fumes are liberated from the melt pots and while pouring the molten metal into the molds to form dies. Dust is created from buffing, shaping and cleaning the dies (Figs. 1 and 2).

The industrial physician should carefully select employees for the foundry and other operations where there is a potential exposure to lead compounds. Syphilis, alcoholism, blood dyscrasia, anemia, and pregnancy are among the conditions which should preclude the applicant's employment in this department. All applicants, and especially those with a history of previous industrial exposure to lead, benzol or aniline should receive a careful pre-placement physical and laboratory examination.

A periodic physical examination should be conducted at regular intervals. The interval between these examinations is governed by the severity and type of exposure. Those exposed to high concentrations of lead oxide fumes should be examined at relatively short intervals. The periodic examination should include a careful history, being careful to elicit the presence of progressive fatigue, abdominal cramps, constipation or diarrhea. A blood smear should be examined for basophilic stippling which occurs relatively early in lead intoxication while anemia develops later. A finding of 100 stipple cells per 1,000,000 is diagnostic of lead absorption and possible intoxication. The persistent finding or progressive increase of these cells in repeated smears, even though in small numbers, should make one suspicious of lead intoxication where there is known exposure to lead.

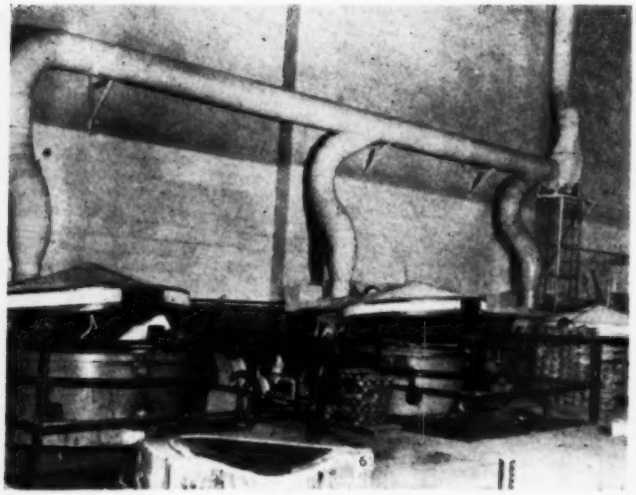

Fig. 1.
Hoods and local exhaust ventilation for melt pots. (Courtesy Douglas Aircraft Co., Inc., Tulsa, Oklahoma.)

Environmental control measures consist of (1) mechanically exhausted hoods over melt pots, (2) good room ventilation, (3) use of protective respiratory devices during pouring operations, (4) local exhaust ventilation for die buffing and cleaning operations, (5) good housekeeping, and (6) good personal hygiene. The temperature of the molten lead should be kept as low as possible consistent with the industrial operations.

Figs. 3, 4 and 5 show die grinding and buffing booths with downward draft exhaust ventilation. Air velocity at the source of dust generation should be 150 to 200 f.p.m. Respirators are worn as additional safeguard while grinding and buffing lead dies. Noxious gases liberated from the core ovens and during pouring should be controlled with exhaust ventilation on the ovens and by general room ventilation.

Drop Hammer

IN SOME plants dies are fastened into place on the drop hammers by means of molten lead poured around the die edges and bolts. In addition the forms are often adjusted and leveled by means of molten lead. These practices expose the operator to lead fumes and dust. Metal clamps can be used to fasten the dies in place of molten lead. This practice has been successfully carried out in some plants. If

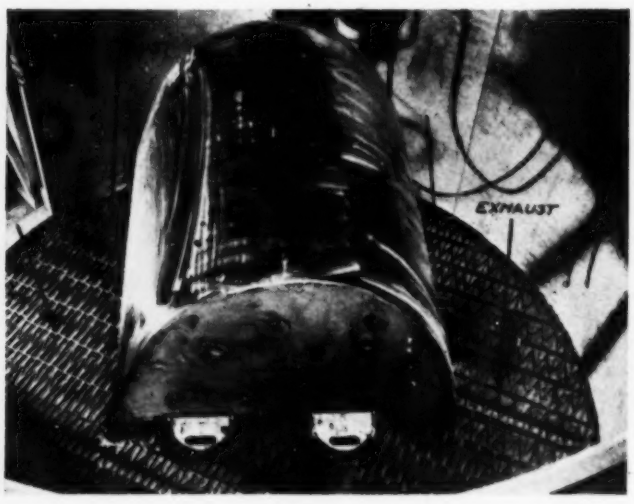

Fig. 3.
Downward draft ventilation with grille for die grinding operations. (Courtesy Douglas Aircraft Co., Inc., Tulsa.)

Fig. 2.
Die pouring operation with personal protective equipment. Room is provided with general exhaust ventilation. (Courtesy Douglas Aircraft Co., Inc., Tulsa.)

lead pots are used for melting the lead they should be provided with mechanically exhausted hoods. Lead and lead dross allowed to accumulate on the floor is often pulverized and dust is dispersed into the air by the vibrations of the drop hammer. All such lead should be kept in covered containers. Good housekeeping should be maintained throughout the workroom. Floors around drop hammers and other equipment should be routinely cleaned using a vacuum cleaner. Brushing or sweeping should not be permitted.

Metal Surface Cleaning and Degreasing

THE processing of duraluminum, magnesium alloy and other metal for assembly includes the use of hot alkali solutions and degreasing solvents such as trichlorethylene, paint thinners, petroleum solvents, carbon tetrachloride and occasionally benzol.

Operations in which solvents are used present definite hazards, therefore, employees to be assigned to this

Fig. 4.
Die grinding booth with metal grille floor exhausted by underground ducts leading to fans outside building. Respirators are worn for additional protection against lead dust. (Courtesy Douglas Aircraft Co., Inc., Tulsa.)

Fig. 5.
Die buffing. Respirator used while buffing lead dies. (Courtesy Douglas Aircraft Co., Inc., Tulsa.)

work should be carefully selected. Those having liver or kidney disease, anemia, syphilis, alcoholism or blood dyscrasia should not be exposed. Employees exposed to vapors of carbon tetrachloride should receive close medical observation. The periodic examination should include a routine blood and urine examination. An icterus index should be conducted on all cases in which there is a suspicion of liver change. Periodic blood calcium determinations are indicated.

Benzol workers should be regularly examined at 10 to 20 day intervals. Individual sensitivity to benzol is successfully prevented only by the early detection of toxic reaction. The urinary sulfate test should be employed. However, this test is to be used only as a laboratory guide by the industrial physician in determining adverse reaction. Emphasis is placed on the fact that a drop of 25% in any blood component is evidence of toxic reaction and is sufficient reason for removal of an employee from exposure to benzol. The industrial physician should insist upon a less toxic substitute for benzol, such as trichlorethylene or acetone whenever practicable.

Dermatitis among workers exposed to solvents is best treated by prevention. This is achieved by impressing upon the employee the importance of observing good personal hygiene. The employee should be instructed in the value of frequent thorough cleansing of the skin and daily application of an absorbable fat such as lanolin and in addition to avoid contamination of the skin with the solvent. Protective ointments, if properly and faithfully used, may aid in preventing skin contact. Impervious gloves and gauntlets, when the operation permits, constitute a more effective protective agent.

All alkali tanks should be equipped with local exhaust ventilation to remove the steam and mists if there is not good general room ventilation. Workers should be provided with face shields and protective clothing to prevent caustic solutions from splashing onto the skin and into the eyes.

Tanks containing hot solvent such as trichlorethylene

Fig. 6.
Degreasing tank solvent vapors are condensed on cold water jacket. Slot exhaust ventilation is provided at periphery of vat. (Courtesy Consolidated-Vultee Aircraft, Inc., Fort Worth, Texas.)

should be equipped with cooling coils in the upper part of the tank to condense the vapors and in the case of large tanks, this should be supplemented by lateral slot exhaust ventilation. Precautions should be taken to locate tanks in large well ventilated rooms and in such a manner that cross air drafts through open doors and windows will not interfere with the vapor levels and exhaust ventilation. The operating instructions of the manufacturer of the degreasing equipment should be strictly adhered to. Cleaning and repair of tanks must be done according to their instructions with adequate protective equipment to prevent harmful exposure to solvent and stabilizers. (Fig. 6).

Small tanks containing naphtha, paint thinners, and other solvents should be located in well ventilated booths. If compressed air is used to remove the excess solvent this should be done within a ventilated booth with sufficient air velocity through the hood opening to entrap the mists and vapors. Care should be taken to prevent the contaminated air from passing by the face and the breathing level of the operator before being exhausted. Wash thinners or lacquer thinners containing naphtha, acetates and alcohols are used in various departments for removing painted identification marks and cleansing machine parts. Only small quantities are used intermittently so that with good room ventilation and use of self-closing containers there should be no excessive exposure.

The use of carbon tetrachloride and benzol as cleaning and degreasing solvents should not be permitted. Experience has shown that other less toxic solvents can be used in most degreasing and cleaning operations. If it becomes necessary to use them, precautions must be taken to provide adequate ventilation to prevent harmful exposure of the workers.

Sand Blasting

CLEANING of some cast steel parts is performed by the use of sand or steel grit with compressed air. If sand is used a potential hazard from the silica dust is present. Sand blasting machine operators should receive a pre-placement chest x-ray. Tuberculosis in any recognizable stage is a contra-indication for employment if there is exposure to silica dust. These employees should have a chest x-ray repeated at not more than yearly intervals and preferably at six-month intervals.

These operations should be performed in enclosed

Fig. 7.
Solvent cleaning and degreasing sink equipped with downward draft exhaust. Compressed air stream is directed downward into exhaust hood

dust-tight exhausted cabinets with the operator working outside the cabinet. If it is necessary for the operator to work inside a booth, he should be provided with an approved sand blasting helmet. Precautions must be taken to insure that the sand blast cabinet is sufficiently dust-tight and provided with adequate exhaust ventilation, and in the case of the sand blast helmet, precautions must be taken to keep it in good repair and provided with adequate supply of *clean* fresh air.

Treatment of Metal Surfaces

CASTINGS, forgings and sheet sections of aluminum and magnesium alloy are treated with various chemicals to produce resistant coatings. Employees engaged in these operations are often exposed to harmful chemicals unless adequate control measures are provided.

ACIDS: Hydrochloric, nitric and sulfuric acids contained in vats and crocks are used for cleaning metal in these operations. Solutions of nitric, nitric-sulfuric and hydrochloric acids give off irritating gases and vapors which should be controlled by mechanically exhausted hoods or by lateral slot ventilation. Bright dip solutions containing sulphuric, nitric, and hydrochloric acids applied to copper and copper alloy surfaces are well known for liberating irritating gases and vapors. In addition to local exhaust ventilation to entrap escaping gases and mists, acid proof gloves, aprons and goggles should be worn by the employees.

METAL PLATING—Chromium, Cadmium, Zinc: Electro chrome plating and anodizing operations expose the employees to chromic acid mist unless local exhaust ventilation is provided to entrap the mist before it contaminates the surrounding air. Figs. 11 and 12 demonstrate chrome tanks equipped with lateral slot exhaust ventilation. The volume of air to be exhausted

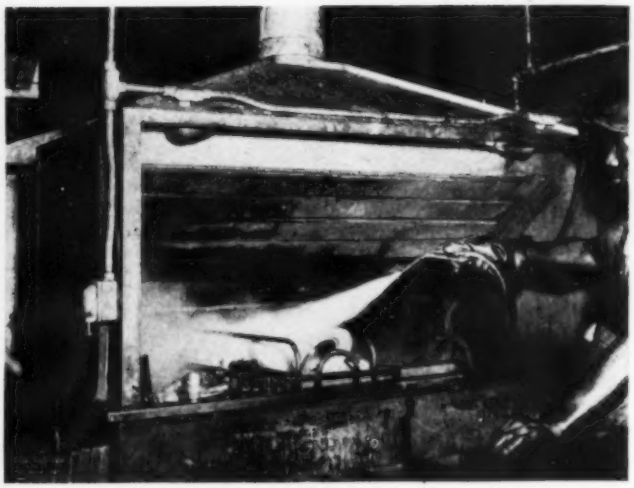

Fig. 8.
Solvent cleaning with compressed air stream

for the efficient operation of lateral slot exhaust should not be less than 120 c.f.m. per square foot of tank area.

"CHROME" ulcers are refractive to treatment. The industrial physician should observe the workmen in this department frequently to elicit early signs and symptoms, and thereby insure against ulcers of the skin or perforating ulcers of the nasal septum. Vitamin A and D ointment or any oily compound such as vaseline when applied to the nasal mucosa has been found to offer protection. Operators should also wear impervious gloves and other clothing to prevent skin contact with the solution.

CADMIUM AND ZINC PLATING: These operations are usually performed in cold cyanide solutions. Practically no cyanide is liberated from the tanks if the proper electric current is maintained and the tank is not overloaded. Care must be taken in the handling of cyanide compounds to prevent skin absorption and ingestion of the chemical.

STRIPPING TANKS: These tanks which contain nitric acid used for stripping anodic and other coatings from clasps and carriers should be provided with mechanical exhaust ventilation to prevent exposure to nitric acid fumes.

HEAT TREAT: The chief potential exposure in this department is to cyanide compounds, carbon monoxide and high temperatures. The soaking pots containing molten potassium and sodium salts and cyanide compounds should be provided with a hood and natural vent stacks to exhaust the heat, and in the case of cyanide compounds allow for the escape of any fumes that may be liberated. Quenching after soaking in molten cyanide compounds may liberate hydrogen cyanide unless adequate quenching solutions are used. Good housekeeping around the soaking pots should be mandatory to prevent cyanide salts from accumulating on the floor where they may be pulverized by the feet of workers and liberated as dust in the atmosphere. Strict personal hygiene must be required to prevent ingestion of the cyanide compounds. Frequent tests should be made around the furnaces for the presence of carbon monoxide. Care should be taken to insure that all discharge gases are burned or vented outside the building. Good general room ventilation or exhaust hood over the furnaces should be provided to prevent excessive temperatures.

Burring, Buffing, Grinding and Routing

ALUMINUM AND MAGNESIUM ALLOY METALS: The principal exposure in these operations is to the

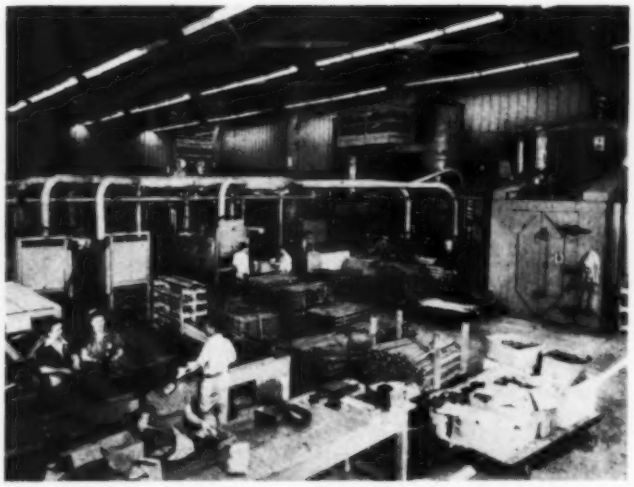

Fig. 9.
Sand blast cabinets with exhaust ventilation. (Courtesy Douglas Aircraft Co., Inc., Oklahoma City, Oklahoma.)

Fig. 10.
Inside view of sand blast cabinet. (Courtesy Douglas Aircraft Co., Inc., Oklahoma City.)

dust liberated from the metal and abrasive wheels. These metals are used extensively in this industry. There has been considerable speculation concerning the relative danger of inhalation of the dusts generated incident to the processing of these materials. Authorities in this country and abroad are in accord regarding the effect of aluminum dust upon the lungs. Hunter, Melton, Perry and Thompson[1] report no evidence of pulmonary fibrosis in 92 workers engaged in grinding duraluminum airplane propellors. Their exposure was heavy and 37 had been exposed more than five years. Although the chest plate of workers revealed abnormal shadows in the periphery of the lung there were no related symptoms. Gardner, Dworski and Delahant[2] have shown that no serious effects follow prolonged daily inhalation of metallic aluminum or amorphous aluminum hydrate. Crombie, Blaisdell and McPherson[3] studied 125 men exposed to high concentrations of metallic aluminum powder from six to 23 years (average 12 years). Their x-ray findings, except for a few cases of healed tuberculosis, were entirely negative. American and foreign literature contains no convincing evidence of pulmonary or bronchial injury from exposure to aluminum dust.

Gardner and Delahant[4] report that inhalation of magnesium dust does not adversely affect the lung. These authoritative researchers conclude that even if manufacturing processes permitted inhalation of an appreciable amount of magnesium dust, it is highly improbable that serious injury of the lung will ensue. This contention is substantiated by animal experiments which demonstrated comparatively little pulmonary air space reaction after 5 to 10% suspension of finely divided magnesium dust suspended in normal saline had been injected directly into the bronchus.

The degree of dustiness obviously varies with each particular operation, so that the need for control measures is determined by the amount of dust present in the working atmosphere. In operations where grinding or buffing is performed continuously, it is advisable to install local exhaust ventilation. Dust respirators will provide adequate protection for oper-

Fig. 11.
Lateral slot exhaust ventilation for chrome plating tanks. (Courtesy Douglas Aircraft Co., Inc., Oklahoma City.)

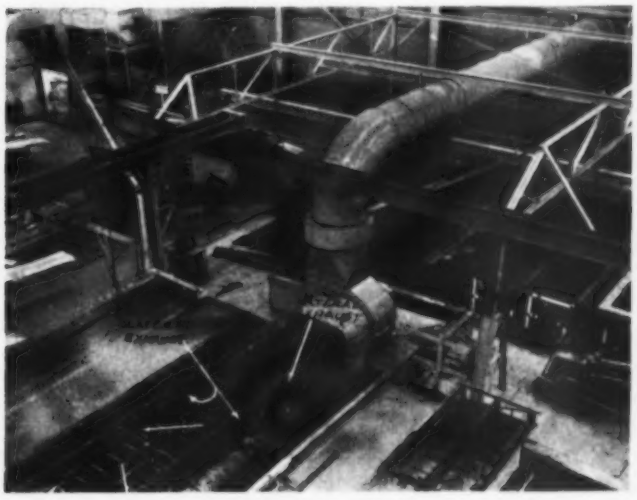

Fig. 12.
Lateral slot exhaust ventilation for chrome anodizing tanks. (Courtesy Douglas Aircraft Co., Inc., Tulsa.)

Fig. 13.
Local exhaust ventilation for abrasive grinding operations. (Courtesy Douglas Aircraft Co., Inc., Tulsa.)

ations intermittently performed. Face shields or goggles should be available to protect the eyes and face against flying metal particles.

Machine Shop

METAL parts are lathed, drilled, and cut in this department. The use of lubricating oils and coolants is sometimes a source of dermatitis. Dermatitis resulting from cutting oils is best controlled by adequate prevention. This is done by careful personal hygiene requiring frequent cleansing of the skin, the use of protective clothing when practical, and daily massage of the cleansed skin with a lanolin base cream.

Some of the thread cutting machines liberate irritating gases from the decomposition of the oils by the heat generated. These machines should be provided with exhaust hoods to remove the gases from the breathing level of the operator.

Grinding and buffiing of tool steel and other metals are commonly done in various departments throughout the plant. Where these operations are continuous, local exhaust ventilation should be provided for each wheel. For exposure of less than two hours each day, U. S. Bureau of Mines approved dust respirators will provide adequate protection. All grinding and buffing of cadmium, lead, and other toxic metals must be provided with exhaust ventilation.

Welding and Acetylene Cutting

THESE operations are carried on in the machine shop and on the assembly lines. The principle hazards are from arc flashes, fumes, and gases from the hot metal and welding rods. Recent studies conducted in a large industry have shown pulmonary changes (localized fibrosis) to be entirely non-pathogenic. The welder should be carefully selected and periodically examined in accordance with the type of material he is required to work. If the operation involves cutting through metal coated with lead-containing paint, fumes of lead oxide may be encountered in excessive concentrations. Stainless steel welding rods contain fluorides, the

Fig. 14.
Hood and local exhaust ventilation for grinding and buffing operations. (Courtesy Douglas Aircraft Co., Inc., Oklahoma City.)

fumes of which may be encountered in sufficient concentration in confined places to produce danger of fluoride intoxication. Salts of chromium are sometimes used in welding rods so that their use may be accompanied with chrome hazards. Preventive measures consist of providing adequate ventilation to eliminate excessive exposure of the welder to the fumes and gases, proper eye protection against the arc flashes and shielding of the arc to prevent exposure of employees in the vicinity of the operation.

Welding performed in enclosed or confined places should be provided with local exhaust ventilation. Portable units are available which consist of an exhaust fan and flexible metal hose which can be adjusted for all conditions. Welding is performed within six to eight inches from the end of the exhaust hose. Fixed welding operations such as are conducted in welding booths should have local exhaust ventilation with exhaust hoods located in such a manner that the fumes and gases are drawn laterally away from the welder's face. All welding booths should have openings at the bottom and top to permit circulation of air through the booth. Precautions must be taken when welding lead or cadmium coated metals to insure adequate ventilation.

Magniflux

INSPECTION of metal parts is performed by the means of magniflux equipment and sometimes by x-ray. Operators of the magniflux equipment should wear impervious gloves of neoprene or rubber to prevent contact of the kerosine with the hands. The x-ray equipment should be carefully screened to prevent irradiation of the operators and the other workmen.

Electrical Department

ASSEMBLY of control cables and electrical wiring involves the use of lead solder. Small solder pots containing molten metal are located throughout the department. These pots should be provided with an exhaust hood, and employees should be cautioned against inhalation of the fumes from the pots and from the solder irons themselves. While the quantity of solder melted and the temperature of the melt is usually not sufficiently high to liberate harmful concentrations of lead fumes, the flux sometimes is irritating to the operators. The use of certain fluxes with oxyacetylene torches is hazardous if the fluxes contain

Fig. 15.
Personal protective equipment for routing and buffing operations. (Courtesy Douglas Aircraft Co., Inc., Oklahoma City.)

fluorides and chromium salts. Fluxes containing borax or boracic acids are not particularly harmful to the operator.

Electric wire which has been impregnated with chlorinated waxes may cause dermatitis. In addition, vapors produced by this coating while the wire is soldered, are toxic and should be controlled by exhaust ventilation. Where adequate mechanical control has been installed the health hazard in this operation is negligible.

In those operations where mechanical control has not been installed the industrial physician should insist upon careful selection of the workmen and frequent medical observation to insure against toxic reaction. Systemically, these compounds affect the liver causing toxic hepatitis which may progress to acute yellow atrophy.

Cable Tinning

ENDS of cables are dipped in molten metal containing a large percentage of lead. The health hazard is exposure to lead fumes and the irritating gases and fumes from the flux. The metal pots should be provided with mechanically exhausted hoods to remove these fumes. The lead dross which is removed from the pots should be kept in a designated container and not permitted to get on the floor.

Fig. 16.
Downward draft ventilation for spray painting. (Courtesy Douglas Aircraft Co., Inc., Oklahoma City.)

Spark Plug Cleaning

THE health hazards in these operations consist of exposure to silica dust and carbon tetrachloride and other solvents used to remove grease and oil. The sand blast equipment should be provided with local exhaust ventilation with sufficient air velocity to overcome the air pressure liberated from the machine when the plug is removed. If the operation is intermittent an approved type of dust respirator can be used.

The use of carbon tetrachloride should be eliminated when practicable and a less toxic solvent, such as trichlorethylene, should be substituted for carbon tetrachloride.

Fig. 17.
Mechanically exhausted water-wash paint spray booth. (Courtesy Douglas Aircraft Co., Inc., Tulsa.)

Fig. 18.
Mechanically exhausted paint booths for conveyor type spray painting. (Courtesy Douglas Aircraft Co., Inc., Tulsa.)

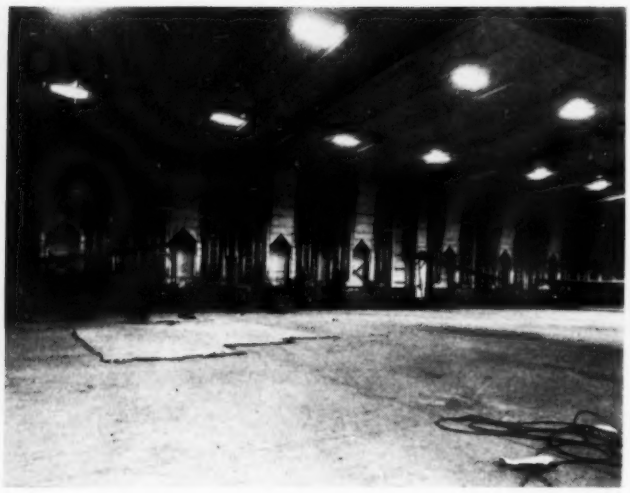

Fig. 19.
Side of paint room. Fresh air is delivered into room through filters. (Courtesy Douglas Aircraft Co., Inc., Oklahoma City.)

Fig. 20.
Opposite side of paint room shown in Fig. 19. Air is exhausted through water-curtain hoods. (Courtesy Douglas Aircraft Co., Inc., Oklahoma City.)

Plexiglass Cleaning and Forming

THE principle hazards in this operation are exposure to organic solvents such as turpentine, dichloromethane, dichlorethylene, isopropyl alcohol, and various other solvents used in cements. Cleaning operations are usually performed with solutions containing isopropyl alcohol. Preventive measures consist of providing a work table equipped with lateral exhaust ventilation with sufficient air velocity to entrap the vapors. Impervious gloves should be worn to prevent skin contact with these solvents.

Stone Felt and Fireproof Coatings

INSULATION material known as stone felt often exposes the workers to the fine silicate dust. The physical properties of this dust are such that it frequently becomes embedded in the skin. Careful manipulation of the material and use of dust respirators and protective clothing will aid in eliminating the difficulty.

Certain asphalt fireproof coatings for cables and ducts have been the source of considerable contact dermatitis. These coatings should be kept covered with masking tape or similar material to prevent employee contact.[5] Protective gloves and clothing will aid in preventing employee exposure.

Fig. 21.
Mobile unit for servicing protective equipment. (Courtesy Douglas Aircraft Co., Inc., Tulsa.)

Rubber Cements

VARIOUS types of rubber cements are used in the aircraft assembly industry. Many of these cements contain appreciable amounts of benzol. Adequate ventilation must be provided to remove the solvent fumes if the cement contains benzol, or better, benzol free cements should be substituted. In the preparation of de-icers for application of conductive cements other solvents can be substituted for benzol.

Spray Painting

AIRPLANE parts, sub-assemblies, completed fuselages, and finished planes are usually painted by means of the spray gun. For the painting of small parts the operations should be performed within well exhausted water-wash spray booths. In the case of planes and large parts this should be done in well ventilated paint rooms. For painting inside planes the workers should be provided with hose line respirators connected to a fresh air supply. Water proofing and painting of small parts inside ships should be done only when the operator is wearing an air-lined respirator. Paint stripping exposes the workers to harmful organic solvents. These workers should wear air-lined respirators while performing this operation.

Doping

THE application to fabric surfaces of "dopes," quick drying cellulose nitrate compounds, exposes the employees to volatile solvents such as toluol, xylol, amyl acetate, butyl acetate and acetone. These operations should be performed in front of an exhausted water-wash spray booth or in a well ventilated room as described under Spray Painting. For intermittent exposure of short duration, protection can be obtained by the use of chemical cartridge respirators.

Noise

VARIOUS operations in this industry are associated with excessive noise. These include riveting where noise is excessive and continuous, and drop hammer operations where noise is intermittent and of high intensity.

Noise has been held responsible for many physiological changes varying from digestive disturbance and mental disorder to a decline in the national birth rates. Edison predicted that city and industrial noises will become greater and create a deaf nation. Proof as

to whether excessive noise is directly or indirectly responsible for these physiological changes will not be attempted here. There is, however, dependable evidence available to the effect that continuous excessive noise is responsible for certain auditory changes. It has been demonstrated that continuous noise causes thickening of the tympanic membrane and stiffening and loss of motion of the small bones. The auditory nerve finally loses its receptiveness for certain high tones and fails to transmit sound of high frequency. Deafness caused by acoustic trauma is characterized by an initial fatigue of the auditory nerve with loss of hearing beginning for the tone of 4096 vibrations and is followed by a progressive degeneration as exposure continues.

The abatement of noise requires special studies and observations of sources of unwanted sounds before control methods can be developed. In general there are three methods of attack upon the noise problem. First, careful study of the noise sources in view of possible means of sound reduction should be made. For example the dampening of machine vibrations with rubber or cork mounts, renewing worn out moving parts, and good machine maintenance are procedures which will reduce noise. Second, provide insulation enclosures for noisy operations. Third, apply acoustical treatment to walls and ceilings. As a personal protective measure ear plugs or ear defenders will lower loudness levels almost 80%, thereby providing some relief for the employee in noisy work areas.

Personal Protective Equipment

THE proper use and care of personal protective equipment is one of the most important factors in safeguarding the health of the employees. Respirators issued to individuals should be of the proper types which are designed to give protection against the exposure for which they are worn. Each employee to whom a respirator is given should be thoroughly instructed in its proper use and care and how to get it cleaned and repaired. Likewise, other protective equipment should be of the proper types for adequate protection and should receive proper care and use. To accomplish this, several plants have provided a mobile unit which continually travels throughout the plant with a qualified attendant in charge who repairs and adjusts personal protective equipment and instructs employees in the proper use of all safety equipment.

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CENTRAL STATES SOCIETY OF INDUSTRIAL MEDICINE AND SURGERY announces the following tentative program for the all-day Mid-Winter Scientific Session to be held in Chicago, Friday, December 7, 1945:

9:00 A.M. to 12:00 NOON: Clinic, St. Luke's Hospital.

12:30 P.M.: Fellowship Luncheon, Palmer House.

2:00 P.M.: Scientific Program, Palmer House: (1) Management of common industrial fractures; (2) Differential diagnosis and management of common shoulder injuries; (3) Diagnosis and treatment of knee injuries; (4) Neuropsychiatric problems in industry.

5:00 P.M.: Board Meeting. 6:30 P.M.: Dinner.

8:00 P.M.: Scientific Meeting: (1) Placement of returned veterans; (2) The psychosomatic veteran in industry.

How the Employer may Evaluate His Medical Service

F M. R. BULMER, M.B., B.Sc.,
and
G. R. McCALL, M.D., D.P.H.,
Department of Medical Services,
Allied War Supplies Corporation,
Montreal

IT MAY be presumptuous to suggest the means by which an employer can evaluate his medical service. Our experience in large and small war plants, however, indicates that management is anxious to have a yardstick by which it can measure the effectiveness of its medical service. This applies particularly to those who are genuinely interested in the welfare of their workers. Frequently employers state that they are in a position to evaluate the work of their entire organization with the exception of that of the medical department. They do not expect a direct profit from this department but they feel that some system of accounting should be provided which will show whether the activities are commensurate with the money expended. Other services are provided by industry but the benefits realized are not always sufficiently tangible to permit a profit and loss sheet. Their work is, however, usually reported in such a manner that its value can be readily appreciated.

The more progressive employers are rapidly realizing that their medical departments should be used for the early detection of non-occupational illnesses, as well as for pre-placement examinations and the care of emergency occupational conditions. They realize also that the early detection of illness can be accomplished only if the workers contact the medical department when they are in the initial stages of ill health. Such contact can be effected by voluntary visits or through a system of periodic examinations. If periodic examinations only are used, the early detection of serious ailments will often be missed. It is important that the workers have ready access to the medical department for the diagnosis of trifling conditions which may be the initial stages of more serious trouble. It is not advisable to depend entirely on periodic checks conducted every year or at longer intervals, for the early detection of disease. On the other hand it is neither practical nor desirable to examine large groups of workers routinely at shorter intervals. The apprehension which minor symptoms may induce is generally recognized, as is also the reluctance to do something definite about them until pain or disability forces an issue. We feel that, where a proper relationship exists between the medical department and the rest of the plant, most workers will seek early medical advice, even for apparently negligible symptoms.

It is natural that an employer should be interested in the pre-placement examination. This subject has been greatly stimulated by army experience. It should be realized, however, that army experience is not necessarily applicable to industry. Warfare requires personnel who can meet conditions of maximum physical output for a continued period of time. On the other hand, in industry the physical output is more moderate and maximum bursts are seldom required. Industry to a great extent uses machinery for heavy work. Many industrial jobs do not require an undue amount of physical energy; in fact many workers suffer more wear and tear getting to and from work than in the actual performance of their jobs.

DR. BULMER is on loan from the Division of Industrial Hygiene, Ontario Department of Health.

In examining applicants for employment the general rate of rejection on medical grounds should be low. Certain categories of workers should not be placed at jobs where their failure could endanger others or which could present definite risks to themselves. Emotional maladjustment of workers in industry cannot always be predicted by the pre-placement examination. It should be realized however, when placing an individual worker, that his probable reactions to the foreman, to the surrounding workers, and to his environment are to be considered, as well as the physical demands of the particular job.

In accordance with the ethics of his profession the industrial physician must treat individual health records of workers in a confidential manner. Unfortunately, however, an atmosphere of secrecy sometimes pervades all the work of the medical department at the expense of proper cooperation with other departments, even with management.

When it functions properly the medical department is an integral part of the whole organization and it should follow a definite procedure worked out in cooperation with all other departments. The use of a questionnaire is of value to ascertain the efficiency of arrangements between all departments, as regards health and safety. The need of such a questionnaire was indicated during our surveys of certain industries in Canada. A detailed inquiry form used during these surveys was completed from information supplied by the heads of the various departments. Frequently it was found that different departments, especially medical, safety, and personnel, had developed independent programs without sufficient collaboration or understanding of the common problems and accepted methods of procedure. Such a situation leads to confusion and sometimes to friction and to duplication of effort. It is recognized that each industry has its own peculiar problems and pattern of organization, but there is no reason why a master service program, formulated by management in conjunction with the various departments of the organization, cannot be developed.

The questionnaire used to test the relationship of the medical department to other departments should be filled out by the heads of the departments concerned. The following questions are suggested:

1. What procedure is followed to permit a worker to visit the medical department?
   - (A) For major accidents.
   - (B) For minor accidents.
   - (C) For major illness.
   - (D) For minor illness.
   - (E) For health advice.
2. Who decides when a sick or injured worker can return to work?
   - (A) Following occupational injury or sickness.
   - (B) Following non-occupational injury or sickness.
3. What disposition is made of workers in relation to their medical category? Who decides their final placement?
4. In placing workers, where is the distinction drawn between "light" and "heavy" work?
5. What "toxic" materials are used?
   - (A) From what source do you obtain information as to the toxicity of these materials?
   - (B) What other departments know the nature of these materials?
   - (C) What methods are used to protect workers handling "toxic" materials?
6. What fire or explosion hazards are present?
   - (A) From what source do you obtain information as to the degree of fire or explosion hazard?
   - (B) What other departments know the nature of these hazards?
   - (C) What measures are used to protect workers from inflammable materials or from explosions?
7. What action do you take in connection with complaints respecting hazardous or unhealthy working conditions? What other departments are notified of such complaints?
8. What action do you take when a new process or new materials are used involving possible hazards?
9. What arrangements have been made in the event of a major catastrophe?
10. Do you attend plant meetings respecting safety, health and other welfare work? What other departments attend such meetings?
11. Are first aid courses provided?
    - (A) Who does the teaching?
    - (B) How many workers attend?
12. Do you make inspections for cleanliness, maintenance of sanitary facilities and cafeteria service?
    - (A) Who else inspects your section for the above conditions?
    - (B) If conditions are not satisfactory, to whom do you report?
13. Who makes and enforces safety rules?

AFTER a questionnaire of this type has been answered and the results studied, it will soon be realized whether or not there is inter-departmental cooperation in that particular plant. The next step is to find out how much is being spent by the medical department and what service value is being received. For years it has been a common practice to quote industrial medical costs in terms of so much per worker per year. The figures given vary considerably. This variation is due largely to the type of service provided and/or to the salaries paid to the staff of the medical department, which, in turn, vary according to the nature and location of the plant.

In order to clarify the picture it is necessary to outline the program of a minimum industrial medical service. Our opinion is that each worker should be medically examined at the time of employment and should be checked at regular intervals. The interval will depend on his age, his physical condition at the time of employment, and whether he is in contact with toxic materials. Facilities should be provided for the emergency care of occupational conditions and of ordinary illnesses occurring during working hours. Initial medical treatment for non-occupational ailments should be supplied and advice given on health problems. The medical department should show leadership in the matter of sanitation and environmental conditions in the plant. This requires a program of plant inspection. It is also important that the medical department cooperate with other departments in the development and enforcement of programs designed for the welfare, safety and rehabilitation of workers and for the betterment of working conditions.

Our experience has shown that where this type of medical service is provided for a working population of men and women in roughly equal numbers, approximately 12 visits per worker per year are made to the medical department. Where women alone are employed the figure is higher (about 18 visits); where men alone are employed it is less (about 10 visits per worker per year). At least one-half of the visits are for minor sickness. About 60% of the accident visits

and 80% of the sickness visits are initial visits, while the balance are repeat visits for the same conditions.

Our investigations would suggest that wherever the visit rate drops below eight per worker per year, in a mixed working population, the medical service needs a check-up. A low-visit rate indicates two possibilities: (1) the workers are not being permitted reasonable access to the medical department; (2) the service provided is not satisfactory. In the latter case it has been found frequently that the work of the medical department is confined to company responsibilities with no service for minor conditions of ill-health, and no attempt is made to conduct an adult health program. Such a restricted service is frequently welcomed by the company physician. It reduces considerably the number of visits to his department.

An extremely high visit rate, e.g., over 18 visits per worker per year in a mixed working population, would suggest two possible conditions, both usually the responsibility of management: (1) there is no satisfactory procedure whereby employees can contact the medical department, the workers coming and going as they please; (2) there are in the plant certain environmental conditions which cause an increase in the number of minor accidents or in the incidence of ill-health.

The employer is in a position to obtain the total yearly cost of his medical department. A breakdown of this information will reveal that considerably over one-half of the money spent is for salaries or wages of personnel. Our experience indicates that about 70% of the total operating cost is for this purpose. We suggest that some "work unit" should be used, in addition to the cost per worker per year, when evaluating a medical service. We consider that the "visit" to the medical department is a satisfactory work unit, and that the "cost per visit" as well as the "cost per worker per year" should be given in reports on the work of the medical service.

An employer establishing a medical service can estimate the cost on the basis of so much per worker per year. This cost will vary, depending on the salaries currently paid in the locality for medical department personnel. Frequently other companies in the same area operating a medical service will divulge the amount spent per worker per year. After the estimated cost per worker per year has been agreed upon, this amount divided by 12 (the anticipated number of visits per worker per year) will give the probable "cost per visit."

At the end of the year, if the actual visit cost is much lower or higher than the estimated cost, the service needs investigation along the lines previously mentioned. Our experience in medium and large war plants provided with a 24-hour service would indicate that the cost per visit to the medical department is approximately one dollar. Under peace conditions of operation on an eight-hour day and based on current salary rates, the cost per visit would be somewhat lower than this figure.

SUMMARY: An attempt has been made to provide the employer with a clearer concept of the functions of an industrial medical service.

A method has been outlined to determine whether the medical service is properly integrated in the plant organization.

A system has been described to evaluate the work done in a medical department using the visit rate and the cost per visit as well as the cost per worker per year.

Experiences with Veterans in Industry

—Follow-up Report—

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IN APRIL of 1944, our experience with veterans was summarized at the New York Academy of Medicine, during the Conference on Convalescence and Rehabilitation of Veterans. This Symposium was published by the Committee on Public Relations of the New York Academy of Medicine. Those interested in the veteran situation will find this publication to be a comprehensive, complete story of the veteran from the standpoint of the Army convalescence and rehabilitation program, as well as in the use of community facilities in the rehabilitation.

Our present focus of attention is on the veteran in industry, but we are not going to emphasize rehabilitation in the sense of elaborate physiotherapy equipment. Rather than "rehabilitation," a term such as "re-civilianization," or, as has been used, "de-veteranization" better explains the process that goes on in industry at present. Whether the advent of the more seriously wounded will alter the nature of our program is to be seen. In April, 1944, in reviewing the records of the 538 veterans working then, probably the outstanding conclusion drawn was that the veteran differed very little from the civilian in the then current labor market. We emphasized the necessity of correlating (in the same way as we do the civilians) all pertinent data. We also emphasized that veterans should be subjected to no more discriminating examination or search than is the ordinary civilian. We also concluded that the "problem" veteran was as unusual as the "problem" civilian. In this report, we wish to check the validity of these statements as of March, 1945.

In approaching the discussion of veterans in industry, there is a common illusion that industry will absorb most of these veterans coming back and seeking a job. Without saying that industry will not, we should like to point out that in the past, only one out of every seven, to one out of four wage earners has worked in industry.

All* types of manufacturing industry during the period 1936-1940 employed 24% of all wage earners; these various types of industry include manufacture of durable goods (automobiles, refrigerators and locomotives), various food processing, and clothing industries. Another 15% was engaged by the service industries—domestics, hotels, laundries, beauty shops, the professions, amusements, recreation; agriculture, 24%; trade, distribution and finance, 16%; Federal State and local government, 8%; the armed forces, 1%; others (mining, transportation, public utilities), 12%.

In the World Almanac, 1944 (pages 518 and 649) a mathematical average would indicate that the average plant or industry has 42 employees, and we must

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*Derived from estimates of the National Industrial Conference Board and from government sources, as published in *G. M. Folks*, August 4, Vol. 7, No. 8.

keep in mind when we talk of the veteran coming back to industry, that "industry" should be thought of in terms of this small shop which employs collectively 80% of that type of wage earner. Our present experience with veterans has been in a large plant, General Motors, Eastern Aircraft Division, at Trenton, New Jersey, employing at one time twelve and a half thousand people and engaged in the production of the torpedo bomber, the Grumman "Avenger."

CHART 1.
MANUFACTURING INDUSTRY'S RESPONSIBILITY TO RETURNING VETERANS*

Total Gainfully Employed in U. S. (1943)	53,000,000
Total Employed in Industry (14.28%)	7,800,000
Estimated Total of Returning Veterans	10,000,000
Industry's Share (Based on 14.28%)	1,571,428

1 OUT OF 7

*World Almanac—1944.

CHART 2.

Veterans Hired February '42 to December '44	848
Veterans Still Working December '44	419
Separation	429

PRESENT GROUP STUDIED, WORKING MARCH '45

TOTAL VETERANS	NUMBER—411	PERCENT—100
Veterans (Age 30 or above)	187	46%
Veterans (Age 29 or less)	224	54%

Chart 2 summarizes the group studied. During a 34-month period, we have employed 848 veterans at one time or another. As of December, 1944, 419 of these were still working here; as of March, 1945, there remained 411. For a 34-month period we had an average net loss of approximately 13 veterans per month; in the last three months of our review period, the average net loss was approximately three veterans per month. The present rate of turnover is somewhat less than that of non-veterans, as will be seen later.

It is interesting to note that only 96 of this veteran group had worked for us before military service. The remaining 315 came to us for the first time after they were discharged from military service. This is important only when one realizes that in conformation with the S. S. A.* regulations, the return of the total 1700 of those who worked for us before entering service could displace all those 315 who are veteran "new employees." That is, of course, a problem of administration of employment departments.

Of the total 411 veterans, we were surprised to find that there are as many 30 years of age and over, as younger. One thinks of the veteran as being a young man somewhere up to 25 years of age. As a matter of fact, one can see that some 50% of them are over 30 years of age, and some 20% are over 38 years of age. Generally, of any given 10 veterans, two of them are age 38 or over, three of them are between 30 and 38 years of age, and the other five are from 18 to 29 years of age.

CHART 3.
TYPE OF DISCHARGE—411 CASES

	MARCH, 1945		APRIL, 1944
	NUMBER	PERCENT	PERCENT
C.D.D.	271	66%	66%
Over Age	88	21%	23%
Dependency	20	5%	2%
Inaptness	7	2%	
Blue Discharge	2	.5%	
Convenience of Government	23	7%	
Unclassified			8%

The over-all picture of veterans so far as the type of discharge is concerned has not materially changed between April, 1944, and March, 1945, with the possible exception of dependency, which shows some trend to an increase; but the number in this group is small and possibly not significant.

So far as the branch and length of service are concerned, one sees a relatively high rate of discharge after a short length of service.

CHART 4.
BRANCH AND LENGTH OF SERVICE
APRIL 1945

Branch of Service	LENGTH OF SERVICE					
	3 Months	6 Months	9 Months	12 Months	Over 12	Totals
Army	66	75	46	28	145	360
Navy	12	10	2	1	10	35
Marines	1	1	0	0	1	3
Coast Guard	2	0	2	0	5	9
Wacs	2	0	0	0	1	3
Merchant Marine	0	0	1	0	0	1
TOTALS	83	86	51	29	162	411

For instance at the end of the first six months, the total 169 is high, as compared to any of the six-months periods thereafter. The fifth column of "Over 12 Months Service" covers up to nine years, and a further breakdown of that group shows a diminishing membership in this discharged group as military service lengthens. One can presume that this relatively high rate of discharge in the first six months reflects the "weeding out" that takes place during the training period. It is interesting to note also that the shortest length of service was one day—that particular case being a man who had a very obvious cardiac murmur with a low cardiac reserve, who somehow or other got through the induction examination.

CHART 5.
BREAKDOWN OF CERTIFIED DISABILITY DISCHARGES—
TOTAL 271 (100%)

			NUMBER	PERCENT
Service Connected			147	54%
A. Incurred in U. S. A.	110 (75%)			
B. Incurred in Foreign Service	37 (25%)			
1. In camp	13			
2. Combat	24			
a. Disease	19			
b. Wounds	5			
Non-Service Connected			100	31%
Unknown			24	15%

Numerous publications worry about "disabled veterans." Charts 5 and 6 show this group.

In our experience, of those discharged because of certified disability, 54% incurred their disability in connection with service, 31% had a disability not connected with their service duties, and in 15% of the cases we were unable to determine whether the disability was service-connected or not. Such information is not easily available; in brief, it involves "disability" compensation, and in our particular group our lowest disability rating was 10% and the highest 100%. The "unknown" group had no defect obvious to us, nor was the specific reason for the C.D.D. noted on their discharge papers. It is interesting to note that of the total 147 service-connected C.D.D.'s 75% were disabled by service within the United States' boundaries, and 25% were disabled by service outside the United States' boundaries. There has been an increase in the number wounded in combat: In April of '44 .6% of all our veterans had been wounded in combat; in March of '45, 1.2% of all our veterans had been wounded in combat. Note that disease caused more combat casualties than wounds.

Chart 6 lists the disabilities present and specifies whether service-connected or not.

In April of '44 we had found that 31% of the

*Selective Service Act.

CHART 6.
TYPE OF DISABILITY IN C.D.D.—TOTAL 271 (100%)

	Service Connected	Non-Service Connected	Unknown	Total	Percent
Neuropsychiatric	41	24	10	75	28%
Leg and Foot	28	7	9	44	16%
Gastro-intestinal	19	5	0	24	9%
Pulmonary	9	11	0	20	7%
Auditory	11	7	2	20	7%
Cardiac and Hypertensive	4	14	1	19	7%
Back	11	2	0	13	5%
Ocular	2	11	0	13	5%
Hand and Arm	4	3	0	7	3%
Kidney	3	4	0	7	3%
Endocrine	2	4	1	7	3%
Infectious Disease	3	4	0	7	3%
Varicose Veins	4	2	0	6	2%
Dermatitis	3	1	1	5	2%
Hernia	3	1	0	4	1%
TOTAL	147	100	24	271	100%

C.D.D.'s were neuropsychiatric cases. Of our present group 28% are C.D.D.'s because of neuropsychiatric conditions. It is not surprising that 10 members of this sub-heading are unknown as to service connection. As was said a year ago and is now brought out by the 24 non-service connected neuropsychiatric cases, psychoneurosis frequently existed before service in as severe a degree as that which led to discharge.

The next big group of C.D.D.'s are the leg and foot defects—flat feet, the arthritics, and knee injuries. These are predominantly service-connected. It is quite possible that most of the "unknown" of this heading will fall into the service-aggravated classification.

Some of the gastro-intestinal group may belong to the neuropsychiatric heading—ulcer of the stomach or of the duodenum is commonly the given cause.

The pulmonary group has been greatly reduced, probably because of the use of pre-induction chest x-ray examination. It was unusual for us to find a case of tuberculosis; but others of this group have hay-fever, asthma, or bronchiectasis.

The auditory group are principally those having punctured ear drums and aggravated middle ear diseases due to auditory trauma.

The rest of the headings are not particularly startling. We had been somewhat unduly apprehensive about malaria, amebiasis, and cholera. However, routine blood malarial slides have revealed no circulating parasites in the few discharged due to malaria.

We have not yet seen the legless, the armless, or the sightless. We have one case of the loss of *one* eye. Last year we had one aviator with a mid-lower leg amputation. Reading the newspapers and periodicals, we anticipated more instances of the loss of an arm or a leg or other major defect. It is probable that few of these amputation cases are ready for assimilation by the public and by industry. I feel that industry and the public are willing to assimilate these cases if and when those veterans are completely convalesced. It would do everybody concerned a great deal of good in emphasizing the urgent necessity of some world organization or international cooperation to prevent eventually such crippling.

Just what is the attitude of the veteran toward his cause of discharge? Chart 7 indicates the improvement in this situation.

One year ago, 30% of veterans did not acknowledge their disability or cause of discharge. As of March, 1945, 17% did not acknowledge their disability or cause of discharge. This may indicate that the veteran is acquiring confidence in the willingness of his community to help him. Although the neuropsychiatric is sometimes in this non-acknowledging group, on the other hand this group includes at least one individual

CHART 7.
VETERANS' ATTITUDE TOWARD CAUSE OF DISCHARGE
411 (100%)

Cause Acknowledged and Verified:		
	Age 30 and over	133 (33%)
	Age 29 or less	170 (41%)
	Total	303 (74%)
Cause Not Acknowledged:		
	Age 30 and over	35 (9%)
	Age 29 or less	39 (8%)
	Total	74 (17%)
Unknown		34 (8%)

wounded in combat and our knowledge of such a wound came first when he was awarded the purple heart.

It is quite human for some of these veterans to conceal their disabilities. Industrial physicians soon lose whatever resentment is aroused by the unwillingness of an applicant to give a true and factual medical history. The physician soon realizes that these persons are not dishonest, essentially. These people are trying to insure their getting a job. They are putting their best foot forward. The average job applicant thinks more of getting a job than he does of his health. It takes a great deal of tact to convince some of these applicants that they should not do a certain type of work, which work might increase their disability.

The alarming aspect of this non-acknowledgment of disabilities is that even a so-called "thorough" physical examination may miss an epileptic, for instance, or a psychotic, or unilateral deafness, or numerous other disabling conditions. This lack of appreciation of the disability of the veteran (or of the civilian for that matter) may lead to placement which is improper; specifically, it is quite tragic to learn for the first time that a person is an epileptic through the occurrence of a fall off a ladder or high scaffold, and whatever agency encourages concealment of such defect is indirectly or directly responsible should such type of accident occur. I bring this up to emphasize that in the smaller industries which do not conduct pre-placement physical examination, some local agent of a Selective Service system or of the U.S.E.S.* must see that the epileptics, the post-concussion syndromes, the cardiacs with a low reserve, the arthritics, etc., are properly placed, for the interest of the veteran himself and for the success of the employer-employee relation.

NOW A WORD more about placement respecting disabilities. Such a practice is common in the larger industries now. The labor shortage has emphasized the necessity of accepting for placement the disabled workers of the community. Many of our larger industries had such a policy for many, many years.

Of the total 411 veterans now working, 262 or 64% have no restriction. 36% have a restriction. This latter figure is less than that percentage, approximately 40%, of civilians who require restricted placement of one sort or another in the present labor market.

Restricted placement is a mixed blessing. There are as many applicants who dislike a restriction for one reason or another as willingly accept a restriction. I find that most veterans fall in the latter group; that is, they realize that their disabilities should be respected. The veteran with a bad heart, or a painful back, asthma, or vertigo realizes that he cannot do certain jobs. The average civilian laborer will take a chance on any job which pays well and thinks nothing of quitting it if his health is eventually adversely affected. There has been too little said about the various

*United States Employment Service.

aspects of restricted placement, i. e., the compensation aspect, the "job right according to seniority" aspect, the "up-grading" or promotion aspect, etc., but a detailed discussion is limited by time. I rather feel that the access of the disabled to a job will sometime be legally defined in the same way that the F.E.P.C. defines access in other respects.

The mechanism of restricted placement is well known. A certain set of restrictions is drawn up and is cross-indexed against the various job classifications in the plant in both a positive and negative way; that is, a person with a painful or weak back can do most cleaning jobs, timekeeping, messenger work, much skilled labor, most of the professional jobs, and others. Conversely, such an indivdual with a painful back cannot do heavy labor. such as trucking, pick and shovel work, or other back traumatizing occupations. Having cross-indexed certain restrictions, such as "avoid heavy labor," against all job classifications in the plant, a functional classification as to physical condition is necessary.

CHART 8.
PLACEMENT RESPECTING DISABILITY—411 CASES (100%)

		Total	Percent
No Restriction in Placement:		262	64%
Restricted Placement:		149	36%
Avoid Heavy Labor	53		
Avoid Loud Noise	23		
Avoid Dust and Fumes	23		
Floor Level Work	15		
Avoid Excessive Foot Work	9		
Avoid Stress	8		
Avoid Skin Irritants	6		
Avoid Eye Hazard	4		
Others	8		

The most common is the simple "Class I—Can do any work"; "Class II—Can do most jobs but has a few minor physical defects (for instance, 'Avoid skin irritants')"; "Class III—Can do only certain limited jobs (for instance, 'Avoid heavy labor')"; and "Class IV—Cannot do the job for which he is a candidate," and other placement is suggested, when possible. A correlation of job restrictions and physical condition classification is then drawn up, and the mechanism of restricted placement is complete.*

That agency which handles veterans (or, for that matter, civilians) and places them in various jobs must have some system of correlation between physical examination and job placement for the good of the veteran.

Proper placement could start at the time of the exit interview by the Separation Classification group of the Selective Service System. At Fort Dix, many councilors were trained to exit interview the veterans and plan for the occupational future. The Army training as to occupation is listed and the veteran is given a contact point in his home area. We feel that at this interview the veteran should be advised as to what sort of work he should not accept for his own good health. There are objections to doing this but we think the advantages outweigh the objections.

Chart 9 indicates that some of our veterans in the group working now have quit at one time or another but later returned to work.

In tabulating the nine who had so quit, we find that seven (or about 80%) had done so in the first six months. This is a small group but probably reflects the unsettled state of mind that existed during the first six months. In addition to some of these temporary quits, there are others who have taken leaves of absence.

*See *American Machinist*, June 8, 1944.

CHART 9.
"TEMPORARY" QUITS

REASON GIVEN	LENGTH OF SERVICE 3 Months	6 Months	9 Months	12 Months & Over
Preferred Another Job	1	2	0	1
Transportation	1	1	0	0
Physical Disability	2	0	0	1
Climate	0	2	0	0
School	0	0	0	0
	4	5	0	2
	9 (Total first 6 months)		2	

Two temporary Quits per 100 Veterans per year (80% in first six months).

Chart 10 shows that in this group of 411 there was a total of 66 leaves of absence.

During the first year, 20 leaves occurred during the first six months; 10 leaves during the second six months; and 36 leaves scattered over succeeding six-

CHART 10.
LEAVES OF ABSENCE

REASON	LENGTH OF SERVICE 3 Months	6 Months	9 Months	12 Months	Over
Sick Leave	6	8	4	3	24
Informal Leave	3	1	0	3	12
Compensable Accidents	2	0	0	0	0
Totals	11	9	4	6	36

Total 1st Year	30
Grad Total	66
Rate per 100 Veterans per year	7
Rate per 100 Veterans first six months	5 (71%)

month periods. It is seen that the first six months is again a period of adjustment during which 1% per month take a leave of absence for one reason or another. The rate thereafter decreases with the length of service. In comparison, we have found that civilians take leaves of absence at the rate of 3% per month, so you see the veteran does very well relatively. Veterans have a turnover rate of 4% per month. Civilians at present have a monthly turnover rate of 4.5% per month.

CHART 11.
SEPARATIONS FROM JOB—115 (GRAB SAMPLE) 100%

REASON		NUMBER	PERCENT
Alleged Ill Health		32	28%
Transportation (Moving Home)		25	22%
Dissatisfied with Job		16	14%
Accepted a Better Job		15	13%
Discharged		13	11%
Repeated Violation of Shop Rules	8		
Legal Arrest	4		
Falsifying Records	1		
Quit (Unknown)		12	10%
To Enter Business		4	3%
Return to Military Service		3	3%
Others		5	4%

Chart 11 shows why veterans quit their jobs or why turnover occurs.

A grab sample of 115 cases was broken down. The alleged ill health group probably contains as many "excuses" as "reasons"; however, this group amounts to 28% of the "quits." Transportation difficulty because of "going back home" or because of having moved the home amounts to 22%. In this group are those individuals who move from the farm into industry, sometimes whole families coming to work from rather distant places.

Probably the next two reasons for quitting could be combined. "Dissatisfied with the job" and "accepting a better job" differ in that one leaves the present job for a job with more security, or more pay, or more promise. Dissatisfaction with the job includes those

individuals who have been tried at several jobs and find none to their liking and then simply quit.

It was necessary to discharge 11% of this group of 115 during the period 1941 and 1942. Since 1/1/45 through 3/31/45, there has been only one such discharge. This ratio of one discharge out of each 10 terminations is greater than the ratio in civilians; namely, one in 25. Whenever a veteran is being considered for discharge, his records are reviewed by the Medical Department and in most instances the veteran is interviewed, in order to determine whether the cause for discharge could arise from any disability, either mental or physical, that might be present. Occasionally we do find a correlation and that veteran then is given more training or more education, and every now and then a happier result is obtained. Since veterans have been permitted to go job seeking without a Certificate of Availability from the War Manpower Commission, "discharges" have decreased.

The rest of this group of "quits" deserve little comment. The "Quit without notice" group includes those whom we have been unable to trace, either in person or by mail.

Now what kind of workers do veterans make?

If we are to judge by the gradings given by job foremen, 97% make satisfactory employees. As employees, the veterans' performance is better than civilians in our experience. The presence or absence of a restriction as a result of physical disability has not influenced the job performance, probably because our employment department has done a good job of placement. The foremen have been educated in a similar way to respect disabilities. They have been willing to help the veteran. I am not paying any more attention to the exceptional trouble-making veteran, who may lean on his service record, than the frequency of occurrence of such a veteran warrants. They are in the minority.

I believe a word should be mentioned concerning the mechanics of employment of veterans. There are certain essentials:

1. A management interested in veterans and friendly to them. A willingness to grant the veteran more consideration than the Selective Service Act reserves for him—some of them cannot do their old jobs. A greater consideration of veterans but no special privileges. Veterans do not wish special privileges, as a rule. Occasionally one will lean on his service record, but he is the exception.

2. Service Discharge papers must be available and the employment interviewer must learn to read them.

3. A thorough physical examination must be done before placement.

4. A system of placement of disabled individuals is essential.

5. Some sort of follow-up, especially during the first 6 months, is necessary. Willingness to transfer the veteran helps.

6. Contact must be established with the various veteran aid agencies. Given a veteran who needs medical help over and above that which can be given at the plant, if the need for medical help arose from the service-connected disability, the Veterans' Administration Hospital Facilities should be contacted and the medical officer in charge appraised of the case. Instructions will be received from that officer as to disposition. It should be emphasized that the Veterans' Administration has no right legally to commit a "disorderly" neuro-psychiatric veteran. The family or the citizens of the community must go through local commitment procedure when indicated and the veteran committed to the local mental institution. Thereafter he may be transferred to the Veterans Hospital Facility.

CHART 12.
JOB PERFORMANCE—TOTAL 411 (100%)

Grading Given		366 (89%)
No Grading Given		45 (11%)
GRADED		366 (100%)
Satisfactory	Restricted Placement	129 (35%)
	Non-Restricted Placement	221 (60%)
Unsatisfactory	Restricted Placement	3 (1%)
	Non-Restricted Placement	13 (4%)

If the medical condition needing attention is non-service-connected, the Veterans Hospital will serve the veteran only if beds and space are available. Service-connected disabilities have priority. At present, most non-service connected disabilities must be treated within the community, by community facilities, such as the local hospitals or physicians, or through the Red Cross.

Concerning non-medical problems of veterans, contact should be established with the State Veterans Service Committee through the Veterans Assistance Program, such as the New Jersey State Veterans Service Committee, under Colonel E. M. Bloomer in New Jersey, authorized by the Selective Service Act mentioned above. Some States have a Division of Veterans Services of the Department of Economic Development and Conservation, such as is headed up by Colonel M. S. Hood in New Jersey, which can function in advising on non-medical problems. Local volunteer councilors, legal or clerical, depending upon the nature of the problem, are available in many communities.

Such a program of coordination and contact has given us an experience with veterans that as a whole has been mutually satisfactory.

IN SUMMARY and conclusion:

1. During the past year there has been no significant change in the physical and mental make-up of individuals comprising the veteran group as a whole in our experience.

(A) There has been a slight increase in the number of veterans who have been wounded in combat. At present they comprise 1.2% of our entire group. Some two-thirds of our total veteran group have Certified Disability Discharges.

(B) The so-called neuropsychiatric group have not been a problem. They comprise approximately 30% of the Certified Disability Discharges in our group. In our experience, 97% of the veterans were graded by their foremen as satisfactory (or better) in work performance.

(C) Evidences of adjustment difficulties are more common during the first six months of employment and decrease rapidly thereafter.

(D) About 20% of veterans in our group are over 38 years of age, 30% between 30 and 38, and 50% between 18 and 30.

2. Disability as it appeared in our veteran group did not decrease productive efficiency.

(A) A system of job placement respecting disabilities is beneficial mutually to employee and to employer.

(B) Medical details of physical conditions can be kept confidential.

(C) 17% of veterans with Certified Disability Discharges do not acknowledge the disability present. This may lead to improper job placement if the disability is not detected on physical examination.

3. The rate of turnover in our veteran group per month is somewhat less than in our civilian group.

(A) Since the War Manpower Commission no longer

insists on a Certificate of Availability for veterans, there have been very few disciplinary discharges.

(B) In our group, disability (mental or physical) has not been a casual factor in disciplinary discharge cases.

4. Employers should have a list of official local agencies which assist veterans.

5. In our experience, the seriously incapacitated veterans have not yet appeared as an applicant for a job (up to April, 1945) in any significant numbers.

6. A policy of greater consideration, but not of greater privilege, has so far proved satisfactory to both management and the veteran.

The Future of Medicine in Industry

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THE health status of prospective, actual or convalescing workers is of primary importance. It is the fundamental factor in the establishing, maintaining and expanding of industry, irrespective of its character, purpose or objective. Health safeguards and improvements have been, are now, and shall continue to be, the subject of paramount issue in industrial progress, as the human element is the one outstanding variable with which something can be done to preserve, insure and reclaim or restore it. Industrial medical service is a generic caption, comprising as it does:

1. Health appraisals, primary and secondary; the former generally pre-employment evaluations, the latter health examinations from time to time, to maintain running records of the personal medical history of the personnel.

2. Emergency medical and surgical service, which is self explanatory.

3. Preventive medical service, which includes known and recognized serological and other measures; the developing and ever-enlarging field of activities to control and, if necessary, correct air and water pollutions, excessive heat, cold and dampness, defective illumination, noises, safety appliances, improper posture and apparel. Finally, there should be cooperation between the medical department in industry and the local health department in the policing of mandatory restrictives and precautions in the control of communicable or transmissible diseases.

4. Educational features, elaborating and emphasizing general health, personal hygiene, sanitation and safety practices.

This brief summary sets forth the fundamentals to which surely will be added more extended medical services, to meet the insistent demands which seem to be taking shape and becoming increasingly apparent.

In this category, to which much thought, discussion and effort have been given are over-all medical, hospital and nursing care of workers, their dependents and families; a satisfactory, workable solution of this vexing and debatable problem will be an Utopian and sociological achievement.

The future of industrial medical service shall be an unfurling scroll of achievements in the application of the art and science of medicine and surgery, relating them to health, welfare and environmental influences of workers. There shall be no delimiting of the agencies, purposes, facilities, activities and efforts to advance, stimulate and assure the best results in industrial health.

This medical epic will be heartening to those who have pioneered during the last several decades; it will encourage those about to enter the service, and it will dispel any lack of appreciation of the real stability, soundness and character of industrial health service at its present level.

Observations in this field, factual in character, warrant predictions, assumptions and conclusions, and can be forthrightly expressed:

1. The back log of achievement is a significant portent. In fact the accomplishments in the past decade are not only splendid and surprising but also glamorous. Its momentum will carry its expansion, development and stability progressively forward into the period when industry without a full-time, part-time or a consultant medical personnel will be looked upon as an oddity.

2. Organized medicine has awakened to the great opportunity and responsibility confronting it. The era of potential opposition did not crystallize in a deliberate frustration. Fortunately that period characterized by an apparent interest, although somewhat lethargic, was supplanted by that important period in which cognizance was evident, positive and substantial. It was in this era that an infiltrating idea was conceived and fostered by the American Medical Association, culminating in the appointment by the Trustees of their Council on Industrial Health. The record of achievements of the Council during its short life stands as a monument to the daring of the Association, the clear vision in the devotion of the Council members to a Trojan task, a misunderstood project, and a definite human, social and economic health problem.

It is no secret that the Council has advanced industrial medical service to an all-time high, especially in the recognition of this specialty; in coordination of medical, surgical and sanitary advances, and relating them to industrial needs and adaptations; and in an increase of the infiltration of physicians into an attractive field of adventure. This triad is fundamental: the venture or concept, the scope with its variations, and the human factor or personnel.

3. The U. S. Public Health Service has made an important contribution, with an impact which shall continue for obvious reasons. This influence is subtle, intriguing and well-timed. The experienced physician in industry is fully aware of this motivate in the accelerated progress during the war era. This agency is responsible for a tremendous amount of research work intimately related to industry, broad in its coverage, having to do with chemistry, physiology, physics, diseases and sanitation. The results of its activities and efforts are available.

It has developed a trained personnel. The persons in this group are cultured, well trained in medical arts and sciences, and practical. There are none better. This service was and is prepared to furnish a group of experienced physicians from its personnel to carry on temporarily in industry; and so to discuss the positive influence of this source of medical service would be laboring the obvious.

Industrial management and the medical profession, in many instances, had to choose between a Federal medical service or that of free enterprise. This had a very salutary effect. Business expansion, shifting populations and increased hazards required an enlarged specialized medical service to maintain manpower, production and security. This cursory statement outlines the role played by the U.S.P.H.S. in its splendid, effective and persistent influence in stimulating progressive advances in industrial medical service.

4. Ten to 15 million persons, the flower of American manhood and womanhood now in the services of their

country have their health care entrusted to groups of physicians, surgeons and sanitarians, dislocated from civil life. These professionals are authorities in their special fields, and in many instances are making tremendous financial sacrifices. The service rendered is excellent. It promotes a sense of security, proves the wisdom of leadership, and manifests human interest.

The Army, Navy and Air Force and allied services, have established a precedent which will have repercussions in the postwar period and become a motivation in socio-economic thinking and planning. The salutary effect will be positive, the analogy is perfect and pragmatism will prove conclusively to industrial management the wisdom of, need for, and practical aspects of an industrial medical service.

The objective, development, stability and value of industrial medical service shall be primarily contingent on the need, cooperation, and devotion of the infiltrating medical personnel. It is reasonably certain that these potential circumstantial influences shall continue operative and be augmented from time to time.

THERE are many influences, direct or indirect. The following may be set forth:

Industry for a long period played a watching and waiting policy. The expansion of medical service in industry was carried forward on its own momentum against resistance, subtle, persistent and intriguing.

Human, scientific, professional and economic interests were correlated and the movement advanced and evolved as a permanent and necessary component in industrial organization.

Humanism is forging to the front, expressed in a combination of social welfare pronouncements relating to a standard of living which at present is very much in the limelight of public thought and discussion. This feature will effectively influence medicine in industry. Human interests are of primary importance.

Scientific research has been prolific in developing medical and surgical techniques, in discovering remedial agents and standardizing laboratory measures and facilities. Availability creates a responsibility which cannot be disregarded. Professional interest is not without its dark side. Misunderstanding, jealousies and prejudicial concepts have been greatly mitigated. The full-time physician in industry moves at ease in all professional gatherings; he is ethical, courteous, cultured, intelligent and respected by his colleagues. His influence in and on the service is significant.

Efforts are being made to accredit the physician thus engaged with acknowledged authority and prerogatives. Another trend is observed in our medical school curricula, which include provision for under- and post-graduate training and refresher courses in industrial health. This removes the stigma of clandestine charges, often encountered. Teaching institutions can ill afford to neglect an opportunity which is destined to serve a great need in the socio-economic world. The economic needs are evident.

Pre- and post-natal care is the start in health care, followed by the pediatricians who, in cooperation with parents, have made significant contributions, and in turn, kindergarten, school, academy and college have splendid medical care programs. Logically industrial medical care is climaxing in character.

Industry has no moral, social or economic right not to furnish adequate health care to cope with the conditions in industry responsible for many of the disabilities encountered. It is probably best to refer first to the higher motives, although the mundane reasons need not be glossed over; absenteeism, decreased production and insurance premiums are potent factors.

The most encouraging sign is the attitude of labor, indicated by its increased interest concerning the health and welfare of its membership. This is as it should be, and organized labor is making a demand for adequate health care of workers, or the alternate—an opportunity of elaborating a program to be administered at the expense of industry. This will promote good feeling and remove the complaint that medical care has been thrust upon the worker without a voice in its planning.

The accomplishments of those promoting and administering health care in the colossal industries devoted directly or indirectly to the war effort, have been staggering, convincing and conclusive.

THIS analysis of the early history, present status and expandability of industrial health service or care is not pulled out of thin air, but is factual in substance, realistic in experience and predictive in its implications.

The future of medicine in industry is assured, its leadership will command the best available. It will be broad, sympathetic and concerned in human interest and relations. It will be fair and open-minded to industry and labor. It will acknowledge remunerative principles in adjusting personal losses and handicaps. And it will hold aloof from compromising situations, prejudiced reactions and unethical practices.

There can be no Federalization or socialization of medicine in industry in peacetime, unless industry *per se* is so controlled. Free enterprise and freedom are not compatible with these restricting measures. Therefore, in thinking, planning and predicting, this possibility may be set aside. Industry shall be responsible for all factors which may result in physical and mental handicaps which can be shown to be directly attributable to work, environment or unsafe conditions, especially those which could have been corrected or removed.

In this era of plastics, synthetics, chemicals, etc., innocent exposure to deleterious substances shall be a responsibility of management. The same holds true when proper mechanical safeguards are not in use protecting the worker. Industrial management is cognizant of two things:

First—the number of deleterious substances is increasing, hazards are multiplying and spurious claims are more numerous.

Second—there are no reasons to anticipate recessions in monetary payments in litigation, settlements or adjustments. This is a sad story. Something should be done.

There is only one answer, select an industrial medical personnel with the best specialist consultants available. The higher the type of personnel, all other things being equal, the better the prospects the worker has of recovering physically, mentally and financially from occupational diseases and accidents. Industry will agree with this conclusion. There should be no place in this program for a mediocre set-up or staff.

The time shall come when the litigation runners shall run to hiding, the litigation examining physicians shall lose their place in the sun, and the legal hireling shall no longer flourish in his nefarious inhumane and selfish practice. In contrast, the physician in industry shall be fair, interested, competent, respected and a friend to those in distress, the consultant shall be a leader in his specialty and so re-

garded in the community, and the other persons involved shall be honorable.

Industry has been money conscious in determining remuneration for full-time physicians and other services by extra-mural physicians. The time will come when this shortcoming shall be overcome to the satisfaction of the persons concerned. Trickery, cleverness and intrigue shall be taboo. Industry can pay commensurably to others and there shall be no peacetime restrictions. This is probably the most potent argument against Federalization of a medical service.

Finally, a considered opinion of all the foregoing is conclusive evidence that medicine in industry shall advance without restrictions; humanely, scientifically and socio-economically.

Summary

THE history, advancing pace and present level of medicine in industry augur well for the future progress in this field.

2. There are infiltrating physicians who have the vision, capabilities and spirit of adventure to warrant progress and stimulate hope of greater achievements.

3. The medical profession has added its blessing and its concrete assistance in advancing all legitimate efforts in industrial health programs and personnel.

4. There are some efforts to advance certification of physicians in this field; these may come to fruition and give impetus to this over-all effort.

5. The combat medical service is a stimulating, helpful and effective prod to all interested in industrial health. This will have a salutary effect on industry when the servicemen return to industrial work.

6. Industry and labor shall come together amicably in understanding and planning health care. There shall be no arbitrary exclusion of applicants on unilateral health examinations in which the records are secretive and a review and appeal by the other party not permitted. There is every reason to anticipate over-all health coverage. The time is not far distant when a physician shall join in conference in management discussions, problems, and plans—and not speak through a non-medical representative.

7. Health care influences service, which in turn influences production and individual income. The latter modifies the standard of living, the objective life goal.

8. The future of medicine in industry is assured. It shall be the most fertile, promising and aggressive field in general medicine without restrictive directives.

9. Industry and labor, in splendid team work, shall support and promote medical research, fellowship and other features to promote and advance industrial health.

In conclusion—There shall be no ceiling on the advances of medicine in industry, the sky shall be the limit.

A New Dressing for Burns and Extensive Abrasions

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SINCE the disastrous Hotel Windsor fire which occurred in New York City in 1899, at which time I was an assistant in the Flower Hospital, and helped care for the severely burned patients brought to that institution from that catastrophe, I have been intensely interested in the treatment of burns, and have carefully studied every new method and innovation in the line of applications, dressings and procedure in the treatment of this distressing condition. I have watched with interest the various new remedies and dressings used and the progress made in combating the shock, sepsis and the relief of the pain incident to burns and extensive abrasive injuries. I have been impressed with the fact that no essentially new procedure in the application of these new remedies has been evolved which has contributed to the speed with which these cases can be dressed, to the ease with which these dressings can be applied, and above all to the alleviation of pain caused by the removal of the dressings, which at all times has been in excess of the application of dressings and in the main in excess of the actual pain of the injury.

Recently I have adopted a new procedure in the application of dressings for burns and extensive abrasions. With the advent of the sulfa drugs in ointment form and also with the newer advent of penicillin in ointment form, I have endeavored to perfect a type of dressing which will be efficient in the application of these newer remedies as well as the old and well-tried ones, and at the same time eliminate the old slow and painful application and removal of these dressings.

After considerable experimentation I have found what, to me, is a new method of application. This application consists in making an envelope of very thin and pliable cellophane. The lower surface of the envelope is perforated with many very small holes or apertures, smaller than the mesh in paraffin mesh gauze, while the upper surface of the envelope is left intact. The envelope is filled with the desired sulfa, penicillin or other ointment which the physician has found most useful, and the cellophane envelope with perforated side down applied directly upon the burned or abraded surface. The ointment is, of course, gradually melted by the warmth of the abraded surface and seeps through the small openings covering the abraded surface and only the thin film of perforated cellophane comes in contact with the wound. This dressing is easily removed without the slightest pain or adhesiveness to the wound surface.

No matter how fast the wound is granulating there is always a film of the medicated ointment between the cellophane envelope and the wound; the cellophane itself, being non-absorptive, does not agglutinate or attach itself to the abraded or granulating surface. A dressing of this nature may be left *in situ* without change at least twice and often three times as long as the ordinary dressing applied on gauze. As none of the medication is absorbed into the dressing, this form of application saves at least 60% of the medication used, which ordinarily is absorbed by the gauze and from the wound surface as well. Any excess serum generated in the wound will gravitate to the dependent portion of the wound and is readily collected outside of the wound area on absorptive material.

These envelopes of medicated ointment may be prepared in advance and kept in jars in layers to be removed one at a time the same as prepared vaseline gauze. Owing to the fact that the envelopes contain the absolute medication required and that they give out their content slowly, the wound is at all times covered and kept in a moist condition by the medication.

The removal of these dressings is absolutely painless. They may be left uncovered on wounds that do not require compression, and on areas where compression is desired they may be covered with soft absorptive material and the pressure applied evenly over the envelope and its contents. It has been my experience that burns and severe abrasions heal faster, require less frequent dressings and are much less painful

than those treated by the direct application of ointment applied on gauze or by gauze impregnated with vaseline or other medication.

I have been unable, so far, successfully to contact any of the firms manufacturing surgical dressings and get them interested in manufacturing this type of dressing. I am informed by the manufacturers of dressings that these would be manufactured and marketed by them if and when the medical profession would make sufficient calls upon them for these dressings. Until such time as one can secure the pre-manufactured article, my present procedure of manufacture is to sterilize the cellophane in sheets, either by autoclave or by immersion in alcohol or other antiseptic solution, and then to cut the sheets into the desired width for the folding into envelope size, and to fill these, one side of which has previously been perforated, with the ointment and then fold the edges into a desired width and pack the filled envelopes in a container.

The same good results will be obtained with these envelopes if instead of small perforations the under side of the envelope is slit in the longitudinal diameter with many fine lines, staggered, of course, by the means of a sharp pointed bistoury.

Any intelligent nurse or office assistant can make these envelopes up in multiples, and they are always ready for immediate application. In my experience of over 45 years of active and interested treatment of burns and abraded surfaces this form of treatment has given the greatest satisfaction in the treatment of such conditions of any method of which I have heretofore known.

This form of application by envelopes filled with plain vaseline gauze or 5% Xeroform in vaseline makes an excellent first application for skin grafts and also for follow-up treatments.

Department of Industrial Health

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THE foundation in 1945 of a Department of Industrial Health in Manchester University and a Professorship is a noteworthy event. This is the first venture of its kind in Britain and has been made possible by the generosity of the Nuffield Foundation. It can well be regarded as one of the most significant forward steps taken in this country in the field of occupational medicine.

That the new Department should be set up in Manchester is appropriate on historical grounds, for it was in this city that Perciveal—better known in the U. S. A. for his classical contribution on medical ethics—made his first move at the end of the 18th century to obtain better working conditions in the textile factories of the district; he used his influence widely in an effort to secure legislation to control the working environment in this industry.

It is appropriate, too, on industrial and geographical grounds. The city of Manchester is set in the heart of a highly industrialized area where the proportion of workers engaged in manufacturing industry is almost twice that for England and Wales as a whole, and where most of the great industries of the country are represented—coal mining, textiles, shipping, chemical and engineering.

The planning of the future of British medicine is receiving much thought and consideration at the present time. It seems probable that the great medical schools based on universities will be the cultural centers of medicine in the future. These schools will not only provide teaching for undergraduates, but will also exert their influence, in different regions throughout the country on the continuing practice of medicine. It is logical, therefore, that an industrial area should have at its university medical center a department devoting itself to the study and teaching of industrial medicine.

It is fully realized that industrial medicine is not, and never can be, a self-contained or natural specialism; it is a functional or "link" specialism and as such has fluid margins. The success of the department of industrial health will depend largely on its degree of cooperation with other departments, not only clinical and medical, but also those concerned with engineering, chemistry, economics and social science. It is for this reason that the foundation of the new Department is such an important step. It will be able to influence a wide range of people: clinical teachers, university departmental heads, medical practitioners, and undergraduates in both medical and other faculties.

The new Department at Manchester will aim at providing courses of instruction for those about to take up industrial medicine as a career and for those who are going to do part-time work in this field, as well as for industrial nurses who must form a vitally important part of any industrial health service of the future. But no teaching department can aspire to remain virile unless it is actively engaged in research; so it is hoped, in this new scheme, not only to study some of the more clearly defined problems of industrial disease, but also to deal with some of the important social and economic problems connected with the relationship between occupation and health.

This work will provide ample scope for young and enthusiastic clinicians endowed with an interest in social affairs, and it is intended to provide fellowships in the Department for those who are appointed. In this connection it is interesting that the Nuffield Foundation has recently announced that it is prepared to award fellowships to men and women who wish to qualify for teaching and research posts in industrial health. Some of those men and women may choose to work in the Department. The experience so gained will be of the greatest value in the future in filling senior posts in this field, and will ensure a more rapid development of this new and important branch of medicine.

It is hoped that the Department will provide a common meeting ground for all who are interested in occupational health, and it should play a full and important part in the postwar health program. We realize, in Britain, that we can learn much from other industrial countries. Great benefit will derive from closer interchange of ideas and experience among those who are doing this type of work. We shall plan for men and women from this University Department to travel in other countries, and to meet, in similar departments abroad, those who are working in similar fields, and, at the same time we, in Manchester, shall welcome visitors from abroad to our Department.

We hope that there will be the closest liaison between ourselves in Britain and our colleagues in the United States of America; this can well be fostered by an interchange of post-graduate students. The problems of occupational health in the modern industrialized community are immense, and it is therefore essential that similar departments to this should be set up in other universities. Only thus can teaching and research in this subject be adequately covered.

These are the plans and dreams for the Department of Industrial Health at Manchester University. It is

realized that if the Department is to play its part to the full it will need the help and cooperation of employers, trade unions, various government officials such as factory inspectors, hospital physicians and surgeons, and of the medical profession as a whole. This cooperation is confidently anticipated. The war has seen a great advance in industrial medicine, and in the years of peace there must be no slipping back.

Value of Industrial Health to Labor

JOHN A. PHILLIPS,
President, Pennsylvania Industrial Union Council

LABOR is intensely interested in the problem of healthful working conditions. A worker must be physically able to earn a living. He spends most of his days at work. It is necessary that he spend those days in healthful surroundings, protected from the health hazards inherent in many modern industrial processes, if he is to attain the normal span of life. Labor is, therefore, most grateful to those doctors who have helped to uncover industrial hazards and to convince management that it pays to eliminate them.

But labor is also vitally concerned with present tendencies in the development of industrial hygiene. Labor wants to be healthy, but labor has other desires, too. And sometimes medical and public health men make suggestions and take measures which cross those other desires.

Labor believes that after the poisonous qualities of the substance or the harmful effects of an industrial process have been discovered, the rest is a matter of engineering control, and is convinced that the place for this control is in the Labor Department as the agency directly charged with protecting the welfare of the workers.

This belief has the general backing of state laws. Employers in most states have a legal obligation to provide safe and healthful work places. In practically all states of the Union this obligation is established under the labor laws and the Department of Labor has the duty of seeing that employers live up to the obligation.

Nor is this system confined to the United States. In England the Inspector of Factories has charge of all factory inspectors, including the medical inspectors. Many of you, no doubt, feel that the system developed in the Public Health Service is the right one. Industrial health is health, you say, therefore it should be under the direction of the Health Department. But the objective of industrial health protection is the welfare of the workers, and that is the basic function of the Labor Departments. The reason for the activity, not the techniques involved, is the important consideration.

If the industrial hygiene division is in the Labor Department it can be used to check on the legal requirements for a healthful work-place. If it is in the Health Department, there is less likelihood of close collaboration with labor law enforcement officers. Sometimes public health men balk at their surveys being used to prosecute an employer who gave them permission to enter his plant. After all, in most states the Health Department is not charged with factory law enforcement. But if the Labor Department cannot obtain exact information on unhealthful conditions or hazardous substances, it cannot properly perform its functions.

When the physician or hygiene engineer works for the Labor Department he is very conscious of the welfare of the worker. That is part of his job. But take him out of the Labor Department and his viewpoint is usually not the same. Some of you may think the professional man is not influenced by such considerations. There recently appeared an item in the February, 1945, issue of INDUSTRIAL MEDICINE which implied they were not. An editorial directed against the bill now in Congress to give the U. S. Department of Labor funds to help state Labor Departments do a better job in health and safety, said: "Health Departments have the ability to carry on health and hygiene services impartially. This is inherent in their professional status for this status not only demands ability, but also imposes the duty to be impartial." Or maybe the writer meant that a doctor or engineer can be influenced only if he works for the Labor Department.

The fact is that all of us are subject to influence. We have seen it time and again in workmen's compensation cases. The insurance company doctor is very conscious of his employer. This is not said in criticism, although labor doesn't like it. But it is obvious that professional men, like all of us, can become biased. The welfare of workers essentially requires that the men concerned with their health must have the welfare of the workers primarily at heart.

Here is another example. In an earlier issue of *Industrial Hygiene* this statement appeared: "Many of industry's problems are due to lack of a mental health program—either in industry or in the community. Accidents, absenteeism, labor troubles, job quitting, are often symptoms of maladjustment." The writer then suggested that the state Health Departments furnish industry with the services of psychiatrists. They would check applicants to discover their intelligence, stability or other personality traits. Now, the term "maladjustment" had broad connotations in medieval times, and there could be no more perfect device for screening out trade-union leaders who are known for personality traits which are not to the liking of many of the employers. Labor had its experiences, too, with pre-employment physicals back during the depression, and now a representative of the Public Health Service suggests a pre-employment mental. Labor does not believe such a program would operate for the welfare of the workers. It is supposed to be in the interest of preventing industrial friction. It would undoubtedly promote it.

The introduction of so-called clinical methods into the workshop will not work out. You may remember what happened about four years ago in Akron when white mice were brought into the shop to determine the effects of some new solvents. The mice died under the eyes of the workers and things got so bad the Rubber Workers' Union had to ask help from the War Production Board. It is absolutely necessary that the men concerned with the practical application of industrial hygiene be completely acquainted with all angles of work relationships. Otherwise, they are likely to make suggestions and take actions which may cause serious trouble.

To sum up: Labor is vitally concerned with the problem of industrial health; it is very much aware of the contributions which have been made in the field of industrial hygiene by the medical profession; it feels that the medical profession has a very definite place in that field, in determining the effects of substances and processes on the health of the workers. At the same time it strongly believes that any state

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or Federal unit concerned with the actual control of health hazards in work places should be located in the Department of Labor.

I appreciate this opportunity of presenting my interpretation of labor's views on this important subject. I hope you will give them serious consideration. I believe that the ultimate aim of all concerned—the physicians, the laboratory men, the engineers and the workers, would be more fully realized through the form of coordination outlined herein.

Planning Industrial Safety for the Handicapped

MARILYN E. JOHNSON

THEY'RE coming home at last, these veterans for whom the war has been unthinkably long. The stream of dischargees which began as a mere dribble months ago has reached flood proportions as the men whose absence has for years created a manpower shortage return to home, and to industry.

Some of them are hardened and strong, ready for a tough job and all the better for their travel and their experience. Some of them are yet undecided, torn between their old jobs and the charm of something new. And some of them will return to civilian life but will never be able to drop the word "veteran" from their name, nor the explanatory word, "disabled." Their return to the jobs they once knew marks the beginning of a longer and harder fight, conditioned by the resistance they must meet as civilians.

Perhaps the edge of resistance has already been turned back for them by the civilian armies of physically handicapped persons who have answered the call of industry by helping to turn out the materials of war. Employers, previously prejudiced against this hitherto untapped supply of manpower, have seen and praised their contribution when the country was in a tight situation. They have acknowledged that two good legs aren't necessary for many hand-operated, or sitting jobs; in short, they have awakened to the fact that because one or two of a man's faculties are impaired, it usually doesn't stop him from being a good worker in a job that doesn't require the use of those faculties.

Certain considerations have been given the disabled in the course of their new-found employment: protective devices on machines, transportation where necessary, counseling and "fitting the worker to the job," to mention a few. True, the road has been made easier for the men who left industry to go to war and return to it with a physical impairment.

Yet the rough and tumble competition of today still offers certain barriers to the disabled, evident in all phases of public life. If a man grew up with his disability, he first encountered obstacles when he attempted to go to school. Here he found the architecture designed without thought of who would use it. Long, steep flights of stairs, lack of hand railings, heavy doors, made education all the harder to acquire. In the world after school, these obstacles were also in evidence, in public buildings and places of amusement which should be accessible to the disabled as to any other citizens.

Unaccustomed to facing such obstacles, the recently disabled, whether in industry or in battle, will find them all the harder to surmount. Just as it is responsibility of production plants to continue to furnish deserving disabled persons with jobs, so it is their duty to turn an eye to these conditions existing in the factory of today which increase the discomforts of persons with a disability.

The innumerable steps, both inside and out of our office buildings and factories are a prime problem which can be eliminated by thoughtful planning both in remodeling and future construction. To climb long flights would be impossible for persons who must use a wheel chair, or even for those on crutches. Proof that a solution is not impossible lies in a glance at many public buildings which have solicited the public trade, such as moving picture theaters, drug and department stores, to which the disabled have easy access.

Drives or parking lots placed adjacent to the office or factory would be of great assistance to the handicapped, and easily handled doors and ground level entrances would enable them to get into the building unassisted.

A convenience that has been neglected in many factories today is the elevator, which is a help and a time-saver to everyone, and might be the saving of a job for a man on crutches who was prevented from reaching his job by several steep stairways. Other menaces to the handicapped are slippery floors, and the narrow aisles so often found between work tables and machines.

Remedying these old-time hazards would bring a new era to industrial safety, and would take a big step toward abolishing many of the causes of injury as well as helping those who need this consideration. Perhaps the biggest contribution would be to the welfare of the employees as a whole; a matter of necessity for some in these matters would be a greatly appreciated convenience for all of the personnel. Thus, while there is much to be done, there is much to be gained in safer, more convenient and modern factories and industrial buildings.

It is fully within our power to see that the disabled find their niche in the production that is America. And whether they do it painfully and laboriously is also up to us. Industry recognizes these men and women as valuable parts in the pattern of production; just as the disabled who have proved their worth as war-workers should be allowed to continue their newly-found useful occupations, so we must realize there are the war disabled, confident of returning to positions that industry must have for them.

They are not looking for "gift" positions, jobs that do little more than take up time. Surveys of the disabled in industry have shown they can bear their share of the burden; their absenteeism, injuries, are no more frequent. They are on a good strong par with their fellow employees. But by realizing the obstacles they face, and doing all in its power to alleviate undesirable conditions, industry can yet find employment for the handicapped worker while taking strong strides towards the reconversion necessary before we can begin to win the peace.

From the Department of Educational Publicity, National Society for Crippled Children and Adults.

LONG Island College of Medicine, Brooklyn, New York, will present its Fourth Post-graduate Course in Industrial Medicine in the three weeks' period between January 14 and February 1, 1946. The course will be conducted under the auspices of the Department of Preventive Medicine and Community Health by a group of distinguished leaders in industrial medical practice, authorities in industrial hygiene and allied fields, and members of the faculty of the College. It is planned to interest especially members of the medical profession who have been with the armed forces, and is timed so as to enable their attendance.

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1946 Conference on Industrial Health

THE five professional organizations which are actively engaged in industrial health activities will hold their ANNUAL CONFERENCE ON INDUSTRIAL HEALTH at Chicago, April 8-13, 1946. These associations are (1) AMERICAN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS (Thirty-first Annual Meeting); (2) AMERICAN ASSOCIATION OF INDUSTRIAL NURSES (Fourth Annual Meeting); (3) AMERICAN INDUSTRIAL HYGIENE ASSOCIATION (Seventh Annual Meeting); (4) NATIONAL CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS (Eighth Annual Meeting); (5) AMERICAN ASSOCIATION OF INDUSTRIAL DENTISTS (Third Annual Meeting). The headquarters of the Conference will be at the Hotel Sherman.

Quo Vadis?

A CONTRIBUTED article in *California & Western Medicine*, September, 1945, entitled "Why Did P.T.A. Support Compulsory Health Insurance?", says in part: "The president of the P.T.A. Congress in a letter recently addressed to a San Francisco newspaper, declared, 'The Congress feels that the child has a right to medical and dental care and periodic check-ups on his general health until he is old enough to take care of himself.' Such statements ring pleasantly in the ears of parents and the public, because everyone knows more medical attention would be good for every child. However, they ignore the fact that state medicine could not of itself produce more care for children or anyone else. Again in the words of the P.T.A.: 'Unless parents *are compelled by law* to give their children regular medical and dental care, vast numbers of childhood ailments, such as defective sight, hearing, poor posture, low nutrition, bad tonsils, huge adenoids, defective teeth, rheumatic fever, TB tendencies and other ills, will continue to haunt the path of childhood!' There's something stupendous about the long list of ailments which compulsory health insurance is expected to cure or allay—but the old fallacy that bureaucratic medicine will mean perfect health for everyone is still apparent. The P.T.A. adds a new note, though, which has some nice goose-stepping possibilities. *Compel the patient to go to the doctor!* Not even the most ingenious drafter of a health insurance bill as yet has tried that idea in any scheme. At worst, he has stopped with the attempt to cajole, coerce or bully medicine into providing regimented service, and to tax wage-earners for the privilege of standing in line in front of doctors' offices."

Purely coincidental was the fact that the sequence of reading wherein this was encountered developed as the next item a reference to the Declaration of Independence, ". . . . unalienable rights; that among these are life, liberty, and the pursuit of happiness"; and as the one following that, a passage from G. K. Chesterton: "When men are weary they fall into anarchy; but while they are gay and vigorous they invariably make rules. . . . We are never free until some institution frees us, and liberty cannot exist till it is declared by authority"; and, believe it or not, as the fourth in this succession, an editorial in *New England Journal of Medicine*, October 4, 1945, entitled "Turn Back, O Man. . . ."

With a sense almost of fatalism, the sequence continues in the question we believe every thinking person should ask, everywhere and repeatedly: "Whither goest thou?" The primrose path so many starry eyes are seeing, leads away from the liberty we have into an "authority" most of us—grounded in *America*—neither want nor need. The P.T.A. path, as above, even smacks of a (Hitler) Youth Movement.

As to the P.T.A. itself, someone should suggest to the parent portion that no law is going to cure parental laziness. Only education will do that—if it can be done. And, lest the teacher portion be convicted of laziness in their instruction of tomorrow's industrial workers, tomorrow's parents, each of them should be interrogated, until there's an answer: *"Quo Vadis, Domine?"*

Bias

IN HIS "Value of Industrial Health to Labor," on page 798, MR. PHILLIPS says, "When the physician or hygiene engineer works for the Labor Department he is very conscious of the welfare of the worker. That is part of his job." An excellent statement! As to the physician, the worker, of course, is his patient, and the physician, conscious of the welfare of his patient is doing a good job. Thus far, he's a good physician. "But," says MR. PHILLIPS, "take him out of the Labor Department and his viewpoint is usually not the same." That conclusion will be very interesting to physicians in general. Some of them, indeed, may inquire how they got into the Labor Department in the first place. To them it may be said that this presentation by MR. PHILLIPS comes closer than anything we have seen or heard to explaining the intent of the clause in H.R. 525 which reads: "In the operations of such plans the available services and facilities of the public health authorities in the field of industrial hygiene shall be utilized." Obviously, it will be found that, if this bill is passed, the "shall be" will prove mandatory.

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—*Continued from page 18.*

health of all persons engaged in business and industrial occupations. It will accept a limited number of industrial concerns as clients and supervise their employee health programs, though it will at no time engage in the practice of clinical medicine. It will, on request, study the biologic effects, harmful or otherwise, of manufactured products and manufacturing processes on workers and consumers. It will conduct researches in the field of occupational health and publish and disseminate information in this field. The School of Occupational Health, meanwhile, will utilize the institute's laboratory, experiments and employee health maintenance program as part of its instruction activities, much as a hospital is used for the teaching of medical students. It is anticipated that the school will be ready to accept enrolments by the fall of 1946. The institute will be in operation before that time. For the time being, both school and institute will be situated in one of the large houses recently condemned for the use of Wayne University. Eventually a building will be provided in the Medical Science Center. DR. HUSSEY is now canvassing the country for prominent medical and engineering personnel in the field of industrial health. These will comprise the faculty of the school and staff of the institute. In a statement to the press, DR. HUSSEY stated that there is no institution of the kind now in existence anywhere in the world. Emphasis will be placed on the humanistic approach to the problem and the concept of occupational health which recognizes the study of health for its own sake rather than regarding health as absence of disease. DR. HUSSEY stated that the staff will be prepared to go into a plant, survey it and provide full employee health supervision of both an engineering and a medical nature, making recommendations on ventilation, clothing, protective devices and all other subjects relating to employee health. The actual practice of medicine will be left to the medical profession. The institute will train industrial physicians and engineers who wish to specialize in such employee health matters as illumination, noise, ventilation, temperature and humidity, plant sanitation, hygiene and safety.

—*J.A.M.A.*, September 22, 1945.

A "Doctor's Guild"

MEMBERS of Southern Pacific Hospital Staff Organize—A new medical organization that may be an advance expression of similar movements throughout the United States was given recent newspaper publicity. From the *San Francisco News* of August 3, the following excerpt: "Doctors Band Into Guild. Organization of a guild of 40 doctors and dentists on the staff of Southern Pacific Hospital to act in the mutual interests of the profession was announced here yesterday. A spokesman of the organization declared emphatically the group is not a union, but admitted one of its concerns would be maintenance of good working conditions, which might eventually include wages and hours. The group will not be affiliated with any labor organization, but will act solely for professional men connected with the Southern Pacific Hospital. The guild is believed to be the first such organization of doctors and dentists in the United States . . ." Delegates who were present at the Special Session of the California Medical Association held in Los Angeles on January 4-6, 1945, may recall Resolution No. 11 introduced by Dr. Daniel W. Sooy, of San Francisco, in which possible formation of a "guild" was mentioned. Resolution No. 11 (not adopted) as it appears in the minutes of the C.M.A. House of Delegates, follows: "Resolution No. 11. Be it Resolved, That a guild of the licensed physicians and surgeons of the State of California be formed to function as a guild under by-laws similar to or acceptable to organized labor with the express desire that a guild thus formed have its fee schedule accepted by organized labor so that should legislation now pending infringe upon the rights of the medical men as governed by the above-described fee schedules, then this guild could affiliate with the two branches of organized labor to further the practice of medicine in the State of California." Concerning comment on the above, it is possible that the pub-

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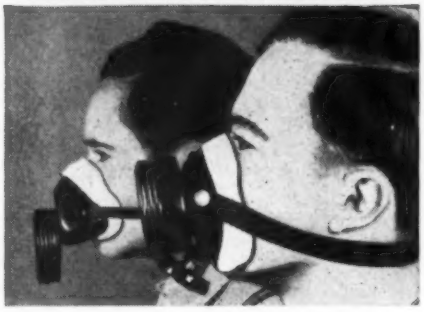

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licity given to the Association of American Physicians and Surgeons of Gary, Indiana, may have had somewhat to do with the organization of the San Francisco Guild. That such a movement should have taken definite form is an indication of the trend of thought by many well-known members of the medical profession. Press items follow: (1) *San Francisco Call-Bulletin*, August 1—"Approximately 40 San Francisco physicians and surgeons have formed a guild to serve as a collective bargaining agency in what is believed to be the first union of doctors in the United States, it was learned today. The physicians, all on the staff of the Southern Pacific Hospital, have elected Dr. James Guilfoil president of the guild. 'The purpose of the guild is to provide a collective bargaining agency under the provisions of the Wagner act—to represent the doctors in matters of wages and hours, if, as and when necessary,' a spokesman of the organization said. The union, according to its members, did not grow out of any controversy with the labor-employer management of the Southern Pacific Hospital, but is the result of several years' thinking. They described relations at the hospital as 'harmonious.' The guild is not affiliated with the AFL, CIO or any other labor organization. Dues of Southern Pacific employees in the hospital association were increased, but spokesmen for the guild declared this was caused by increased costs and not because of the doctors' union. In addition to Dr. Guilfoil, officers of the guild include: Vice-President, Dr. Edmund J. Morrissey; secretary, Dr. Robertson Ward; treasurer, Dr. Wilber F. Swett; directors, Drs. Thomas E. Gibson, James J. McGinnis, Vance M. Strange and John Jay O'Connor." (2) *San Francisco Examiner*—"In what is believed to be the first union of its kind, approximately 40 San Francisco physicians, surgeons and dentists have formed a group called the Railroad Physicians and Surgeons Guild here, it was disclosed yesterday. All are members of the staff of Southern Pacific Hospital in San Francisco. A spokesman denied reports that the prime purpose of the guild is to provide a collective bargaining agency under provisions of the Wagner Act: 'We sought to organize, so that we could cooperate with the Southern Pacific Company, the hospital, and its board of managers to give better service. In our purposes outlined for the guild, collective bargaining was not one of them. However, if the occasion arose, we presume collective bargaining would be entailed.' 'There appears to be nothing different in this guild in comparison to the various medical societies and organizations now in existence except that this is called a guild,' said Dr. G. Dan Delprat, president of the San Francisco County Medical Society. 'As for collective bargaining—if and when it became necessary—the San Francisco County Medical Society has done some collective bargaining. This was when we had objected to the way the health service operated and we advocated that the system be changed.'"

—*California & Western Medicine*, August, 1945.

INSIDE story (on the "Doctor's Guild," above), according to San Francisco informants, is that the contract set-up with the Southern Pacific Railroad as regards hospital and medical care is being subjected to certain pressures, with a desire on the part of the corporation to be relieved of part of its responsibility in favor of the railroad unions. In the pressure plays some doctors feared they might be caught in the middle of the squeeze and become the ultimate victims. Purely as a security weapon it was felt advisable by the doctors now employed by the Southern Pacific hospital set-up to form this union. Significant tip-off is the wording "if, as and when necessary."

—*Northwest Medicine*, September, 1945.

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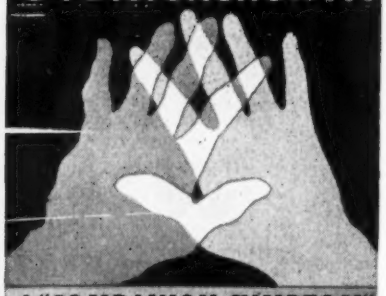

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—*The Mining and Contracting Review*, April 15, 1945

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SPINAL HYGIENE, publication of the Michigan Chiros, states: "The Girdler Corporation of Louisville, $25,000,000 corporation handling government defense contracts running into millions, has employed a chiropractor as the doctor in charge of health of its employees". . . . Further, it has been made mandatory that all Girdler employees keep their health in good condition by using chiropractic. Industrial surgeons please note. We knew you were using the osteos, but this is the first instance we heard of where the chiros were in.

—"Rant and Rave," in *Detroit Medical News*, September 17, 1945.

How It Was Done

THE War Manpower Commission enlisted the cooperation of industry, management, labor and community leaders and through the nation-wide network of more than 1,750 U. S. Employment Service offices built a labor force of nearly 60 million men and women who staffed America's production lines and war-supporting industries.

—WMC Release, September 18, 1945.

Call It What You Will

OBVIOUSLY, when a compulsory system of government-medical-care insurance is set up to embrace the bulk of a people, that is socialized medicine. When the government hires doctors like postmen and pays them salaries, that is state medicine. The Wagner-Murray-Dingell Bill provides for both.

—From an Editorial, "If Not, What Is It?" in *Christian Science Monitor*, August 4, 1945, reprinted in *New England J.M.*, August 30, 1945.

Social or Tax Measure?

A HOUSE Ways and Means Committee attache predicted fireworks when the hearings on the new Wagner bill begin, with the bill's supporters hard put to force it to the floor of the House. It was the Ways and Means Committee that smothered the earlier W-M-D bill, for which reason Senator Wagner, in a floor speech, sought to have the new bill sent to a Senate committee, on the grounds that it was social legislation and not a taxation measure. The Senate, however, disagreed.

—*Medical Economics*.

On Prevention of Colds

EVERYONE can achieve some immunity from acute respiratory infections such as colds; most people need never have a cold again, according to DR. MARSHALL C. CHENEY, associate physician, Student Health Service, on the Berkeley campus of the University of California. Summing up data secured from observations of 18 years on more than 20,000 university students, DR. CHENEY says that cold vaccine plus proper hygiene and other therapeutic measures will protect all except those unfortunate individuals who have inherited extremely poor automatic defense.

—University of California *Clip Sheet*, July 23, quoted in *California & Western Medicine*, August, 1945.

That Backache

THE devil's own work and a misbegotten gift of civilization is the inner-spring mattress. A professor of bone surgery in one of the best known medical schools in the country declared that if he had his way it would be a Federal offense to sleep on an inner-spring mattress. During sleep, when the muscles should relax, it causes them to contract unequally. People ought to sleep on hair mattresses, soft enough to be comfortable, hard enough to afford the muscles to rest. The frequency of mattress-aggravated backache can be seen by the increase in the sale of sleeping boards designed for use between mattress and springs. Lately, a further refinement has been made, a folding board for people who travel.

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Many who used to wake up with backache can thank this contrivance not only for a comfortable night but for a comfortable day after.

—From "What Doctors Know About Backache," by AIKEN WELCH, in *The American Mercury*, August, 1945.

The Industrial Medical Officer

THE medical officer in charge of the industrial medical program at an Army-operated industrial installation has two main functions: (1) the emergency care of sick and injured employees, and (2) preventive medicine. Both are essential. A medical officer may administer an excellent emergency medical service; but unless he knows the employee's job, the materials with which the employee comes into contact, and the environmental conditions under which he works, he cannot evaluate symptoms arising from occupation, nor will he be able to make recommendations for the prevention and control of occupational illness. The industrial medical officer must know his plant and the types of operation going on therein. Recommendations for the improvement of conditions affecting employee health within the plant are the responsibility of the doctor. It is impossible to judge the ability of a prospective employee to carry out the work to which he is to be assigned without sufficient knowledge of what this work entails. Adequate time should be devoted to observation of plant operations and general working conditions.

—From Army Service Forces Manual M210, "Operating Procedures for Industrial Dispensaries," March, 1945.

What They Want

IN ORDER that the Fort Greene Industrial Health Committee can be of value to all workers in the area, its program must be fitted to the individual needs of the employees in each participating firm. Our first definite venture in health education for the worker while on the job was the tabloid, "Here's to Your Health." This tabloid is published twice a month and is distributed to each employee in the cooperating firms. In some firms, it is distributed with the plant paper, and in others it is distributed by the guards. During a recent month, we were led to believe that employees of cooperating firms were not reading the tabloid and, for this reason, we sent letters to 15 cooperating firms asking whether they would be willing to sample about 5% of their employees as to the employees' reactions. Ten firms stated that they would be willing to make the survey and to date replies have been received from six of these firms. We find from this that in the firms where the survey has been conducted, 86% of the employees receive the tabloid. Of these, 91% state that they read it, 48% take it home to their families and their families read it, and 82% feel that it is of real value. A few of the criticisms which we received are as follows: "Causes of various ailments, but not enough preventive or treatment explanations." "I think a short article in each issue about some medical development would be interesting—say Rh factor, penicillin, or something of the sort." "Seasonal subjects could be stressed with each issue, along with one general item." Physical benefits of exercises explained." "Longer and more scientific articles." "More facts on diets —reducing, gaining, and energy-building." "More question and answer columns." More specific information on health and disease." "Encourage contributions by readers."

—From "Medical Cooperation with the Fort Greene Industrial Health Committee, by CHARLES F. MCCARTY, M.D., Director, Medical Activities, Kings County Medical Society, Brooklyn, New York, in *Am. J. Public Health*, September, 1945.

The Burnie Plan

HOW much further the effort to establish the family spirit in industry can be carried is indicated by the Burnie Plan. At this beautiful seaside resort in Northern Tasmania, Associated Pulp and Paper Mills Limited has established a large pulp and paper mill where high-grade printing papers and also writing and typewriting papers are made. There are about 750 employees at these mills. The production is about 20,000 tons of paper a year. In establishing a cooperative policy and a family interest, the first fund established was for medical services. Doctor, hospital and medicine for employees and their dependants were covered by a contribution of 6½d. per week from each employee, and a similar amount from the company. An arrangement was made with the local doctors to pay them 30/- per employee per year. The hospital agreed to accept 8/- per

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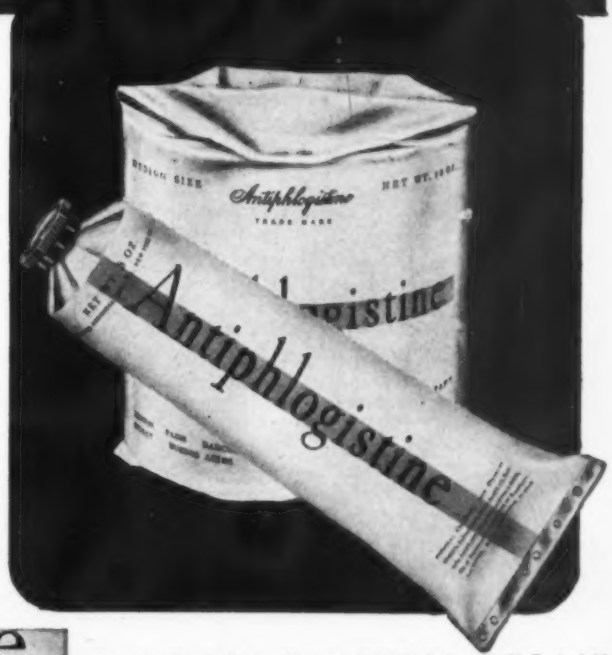

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employee, and the chemists a similar amount. The revenue from the contribution of the employees and the company totalled £2/16/4 per employee per year. The above contracts amount of £2/6/-. From the surplus of 10/4 per member, the Trustees were able to provide for specialists' treatment at Burnie, Launceston, Hobart, or Melbourne, as the trustees deemed necessary. However, since the war, owing to the increased cost in drugs, an amended arrangement had to be made with the supplying chemists. The sickness and accident fund came into existence on May 1, 1940. The basis is a weekly contribution of 7d. from each employee and a similar amount from the company. This enabled the payment for absence due to sickness or an accident occurring when off duty of £2/4/- per week, and a subsidy of £1/2/- per week if the employee was absent through accident occurring while on duty in the mill, this latter payment being in addition to that required by the Workers' Compensation Act. These benefits were payable only to married employees who had dependents. Single employees without dependents receive £1/4/9 per week for absence through sickness or accident off duty, and 12/10 for absence through accident on duty in addition to the Workers' Compensation Act amount. Thus single men are required to pay the same weekly contribution as married men, but single men receive lower benefits. It is noteworthy that after the passing by the Federal Parliament of the Unemployment and Sickness Act, the employees approached the Company with a proposal to increase their weekly contribution to the sickness fund by 3d. per week per employee. The company willingly agreed to increase its contribution by a similar amount. The trustees then decided to give these further additional benefits: If an employee is absent from work through sickness or accident for more than one month, the benefit already mentioned shall be increased by 50%. Further, the fund would pay for minor operations, patent medicines, and proprietary lines, while in cases where specialist treatment was required, the Fund would pay the cost and the fares and the board of the patient in the city where the specialist lived; still further, if the patient found it necessary to be accompanied by a friend to the specialist, then the fund would pay the friend's fare and board while away. Another novel extension of benefits was also introduced. If an employee wakens in the morning and finds that owing to the illness of his wife or family he must stay at home and look after them, then he can claim on the sickness and accident fund for the period of absence.

—From "The Family Spirit in Australian Industry," by SIR GERALD MUSSEN, Director Associated Pulp and Paper Mills Limited, address delivered to members of The Institute of Industrial Management at Kelvin Hall, 55 Collins Place, Melbourne, published by the Institute of Industrial Management.

"Social Security" Needle

EDITORIAL comment has been made in the past in reference to the enormous taxation that will be necessary to carry out many of the proposed social security benefits. To substantiate what has been written, we would like to reproduce an editorial that appeared in the *Times-Picayune* on May 18 under the above caption: "Senator Wagner is reported to be preparing to introduce bills for vast expansion of the so-called 'social security' program. If the outline given of his plans is correct, they mean the imposition of new gross income taxes, on top of war taxes, of 3%, both for employers and employees. The field of taxation would be extended to 15,000,000 persons employed in domestic and farm work in non-profit institutional work, and to their employers; and likewise to the self-employed. Part of the extra money, under these reported proposals, would be used to finance increases in current unemployment, old-age and aid outlays—provision of medical and hospital care to all workers and their families; increase of weekly unemployment payments to $30; provision of both temporary and total disability payments; and reduction of the old-age eligibility requirement for women from 65 to 60 years. The part of the increased revenues which would go to current disbursements is not

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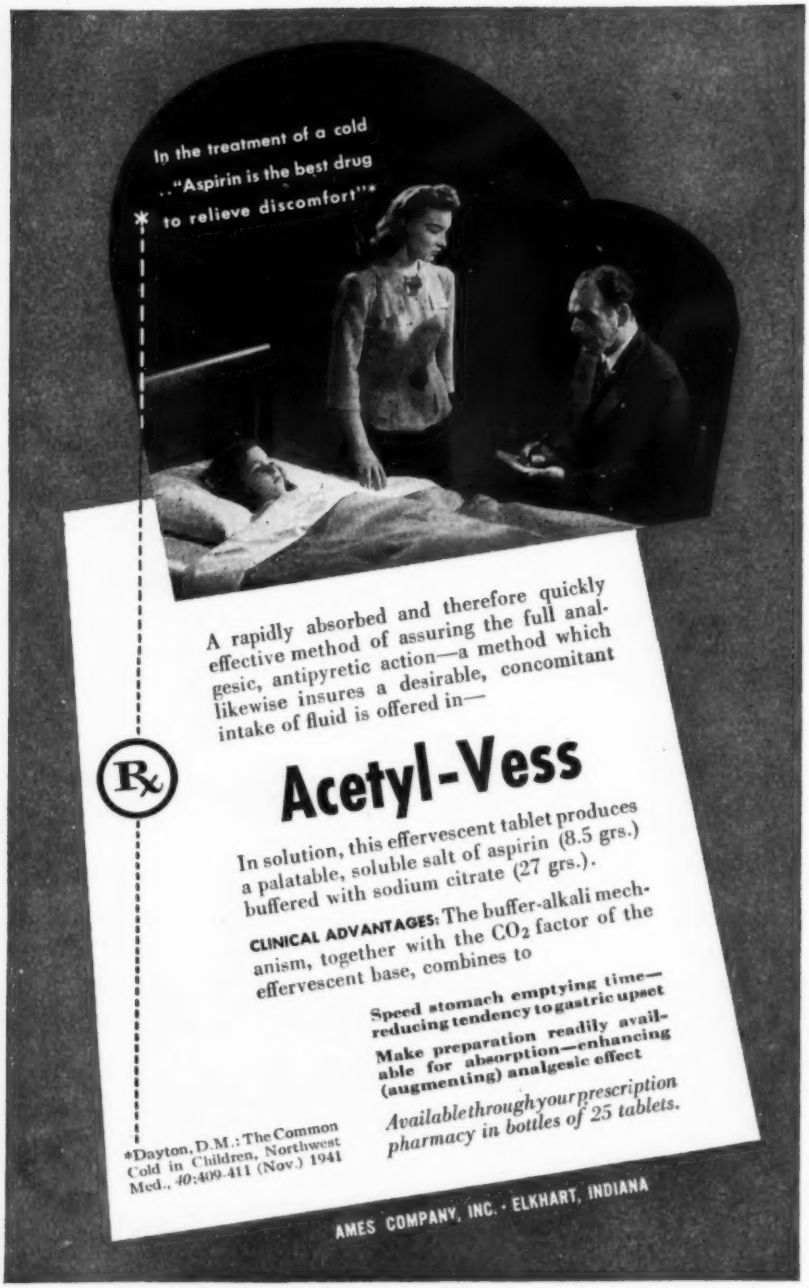
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*Dayton, D.M.: The Common Cold in Children, Northwest Med., 40:409-411 (Nov.) 1941
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given. It can readily be increased, under the inflationary mania, by rising costs and continual upward revision of the benefit payments. The last process is a bucket without a bottom, or a cone without a top, once the pressure begins. Theoretically the increased benefits proposed could be provided temporarily from the accrued social security 'fund.' There is, however, no such fund in cash, or productive property; it exists in bonds which are serviced by current taxation. Every dime of the proposed increased 'social security' taxes over and above current disbursements will go into the same fund. Proceeds from that investment will be spent for other current government needs and obligations. Thus all surplus from the heavy 'social security' taxes will become government revenue, expended for general purposes on the current scale of high costs and prices. Should the fund itself ever be called upon to meet a real unemployment emergency, the people will find that to liquidate and make available the bonds, 'all' they will have to do is pay the necessary extra taxes to liquidate them. They will tax themselves all over again to sustain their unemployed et al. The name of 'security' for the latter has been taken in vain long enough."

—*New Orleans M. & S. J.*, June, 1945.

"Social" or Political?

THE demand for compulsory health insurance, it may be concluded, is promoted most powerfully by organized collective action, especially by organized labor. However, the opportunity for such action is not always present. It is easier to organize in depression than in prosperity, easier in industrial than in agricultural states, easier in large cities than in small towns, easier in areas where medical service and facilities are well organized. We are then in a position to summarize as follows: The most powerful single force responsible for the origin of the demand for compulsory health insurance is organized labor. The time most conducive for this demand is a period of depression. The place most conducive for formulation and pressing of such demand is the large city. Apparently, the opportunity to organize the demand is more important than the prevalence of the need for medical care. The evidence points to the probability that, contrary to popular belief, the legislative proposals for compulsory health insurance are based not so much on social needs as on political interests, and that the ability on the part of labor to organize and press the demand, rather than the concern about the state of health, is the primary consideration. Organized labor is strongest in the most highly industrialized and urbanized sections of the country. It is only natural that labor-promoted plans for compulsory health insurance are designed chiefly in the interests of industrial labor and are modeled to fit the conditions prevailing in highly developed areas. But these conditions are not typical of the country at large, nor are they the major part of our national health program. Therefore it may be said that such plans hardly promise an adequate solution of that problem, which is made up of many different factors apart from those that characterize conditions in the large cities. Illness apparently is not chiefly responsible for the demand for compulsory health insurance. If it were, recommendations would start in the medically least progressive states. However, they originate at the opposite end of the scale, where medical care and social services are most highly developed. The proposed recommendations do not and apparently are not designed primarily to solve the health problems in rural areas, economically underdeveloped regions and among under-privileged groups.

—From "Health Insurance," by CARL W. STROW, Research Consultant, and GERHARD HIRSCHFELD, Director, Research Council for Economic Security, Chicago, in *J.A.M.A.*, July 21, 1945.

Are They?

GEN. BRADLEY, Veterans' Administrator, said today the U. S. Veterans' Administration had "some pretty poor doctors," but added they were "better than no doctors." "We know," he said at a news conference, "we have some pretty poor doctors, but the question is, aren't they better than no doctors since they can't be replaced?" Gen. Bradley said the administration now had 2,300 doctors and needed a full staff of 3,600. Of the 2,300 Veterans' Administration doctors on the present staff, he added, 1,700 were a loan from the Army and Navy.

—*Chicago Tribune*, September 28, 1945.

CURRENT ARTICLES of QUALITY

Industrial Rehabilitation

ANDREW J. JACKSON, M.D., Medical and Surgical Director, Waterbury Branches, American Brass Company, Waterbury, Connecticut, "Industrial Rehabilitation," in *Connecticut State Medical Journal*, 9:8, 600-602, August, 1945. Text: "Now all the presumably new words which have recently gained wide circulation have had their origin in the war. In the days of the Romans, there existed such a word as 'habilitare,' which meant 'To make fit or restore to normalcy.' The syllable 're' preceding this word has the meaning 'again;' hence, their world 'rehabilitare' signifies 'restoration to one's former condition or status as far as his emotional and physical stamina is concerned.' After centuries of usage the term has retained its original meaning, but the complexion of its present day connotation is somewhat altered. Today, it seems to be restricted to those with physical and mental disabilities received at the fighting front or in industry. It is a veritable benediction that so much attention and effort are focused upon returning the incapacitated soldier or laborer to a position wherein he can feel that his contributions to industry are as essential as those of his more fortunate fellow workers who have never been the victims of physical or mental handicaps. Rehabilitation carries a twofold blessing; one to the employer who has assisted in a man's restoration; the other to the recipient of this attention because it makes him realize he is not an object of charity, but a real participant in the battle of life. One of the greatest challenges today to industry and to industrial medical organizations, after peace has been won, is rehabilitating the disabled veteran. The term, 'disabled veteran,' is not confined to those wounded or injured by shell fire on the fighting lines, but likewise to those on the home front, who have contributed so much to make victory possible. Rehabilitation is our problem and we must meet it resourcefully, restoring the handicapped to as thorough a physical, mental, social, vocational and economic functioning as his capabilities permit. War conditions have definitely proved that man can be readily rehabilitated. It has been possible to take men from all paths of life, to completely change their mode of living, their occupation, their social and economic sphere; in short, to readjust them so that they may fight, work and win the greatest war of all time. This being true, the rehabilitation and restoration of the physically disabled are a foregone conclusion. The war casualties will be well on their way to recovery when they are returned to civilian life, and ready for employment, and it should be and is the aim of industry to carry on and complete the work already begun. In order to evaluate accurately a candidate for rehabilitation, we must consider first, total-temporary disability. Such cases as fractures, dislocations, lacerations, digital amputations, strains, etc., are usually of short duration as indicated by an early return to work. Secondly, we must consider permanent disability. This embraces a very small percentage, and, for the most part, progress is frequently retarded by unnecessary litigation control. Thirdly, we must take into account the partial-temporary disability, the victims of which rehabilitate themselves quickly because they are kept on the job, and consequently, do not become neurotic or hypochondriacal. And fourthly, there is the partial permanent disability which calls for definite rehabilitation carried out through surgery, vocational training, physio-therapy, massage, hydrotherapy, etc. Larger industries for the most part have become medically business minded, and have come to realize that their interest in the employee goes much further than the treatment of injuries arising out of, and in the course of, their employment. Such cases, according to estimates made, account for only 7% of industrial absenteeism; occupational diseases cause but 3%, while 90% of the absenteeism is due to sick-

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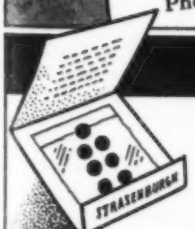

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ness of non-occupational origin. This realization has caused industry to evaluate its manpower by periodic physical examinations as well as by replacement examinations, and has taught it to accept rehabilitation as a paying policy. Otherwise, business must expect to be confronted with more and more regimentation through taxation. This rehabilitation, for sound economic reasons, applies especially to the smaller industries which predominate in American production, and which lack well organized medical supervision. Most large industries have a well functioning medical organization and hospital equipment, with efficient nurses and attendants, and a medical and surgical consulting list, made up of specialists. Pre-employment physical examinations are made, and follow up records are kept. Surgical rehabilitation will call for plastic, reconstructive, remedial, reparative, neurological, orthopedic, genito-urinary, and dental surgery. Medical rehabilitation entails a thorough examination of the cardiovascular and cardio-respiratory system as well as a detailed study of the metabolic diseases. Neuropsychiatric rehabilitation, consists of psychoanalysis, psychoneurotic adjustment, and the treatment of psychosomatic diseases, functional disturbances, cerebro-spinal lesions, and the evaluation and control of epilepsy. In traumatic disabilities, when a man is injured one of four things ensues, a pathology is created which may be a partial, a partial-permanent, or a total-permanent disability; an aggravation of a pre-existing disability is caused which may render a man partially or permanently disabled; it may precipitate the symptoms of some latent process which may result fatally; or accelerate a pre-existing pathological condition. It is essential, therefore, that thorough pre-employment, periodic and replacement examinations be made so that candidates for rehabilitation will have a complete and accurate evaluation of their physical status. When a physically handicapped man is placed successfully, he ceases to be a handicap from the standpoint of his productive ability and his earnings. It is the duty of the examining physician to outline in detail the disabilities which make the employee unsuited to certain types of work, and to point out the danger of employing a physically handicapped man in fast moving machinery or heavy lifting. There are certain men who should work only on ground level and there are others who should avoid dust and fumes. With regard to the tuberculous employee, little need be said. In the sanitariums of the state of Connecticut, the training and education of the patients render them well able to cope with their disabilities. In fact, these institutions have been virtual pioneers in the field of our present day rehabilitation. Readjustments will be difficult. This we must anticipate. It will be hard to rehabilitate the young veteran, who has learned no trade but war. He is a stranger to the ways of making a livelihood. It will be a problem for men returning from the battle fronts to find their places in a world at peace. The person who has been forced to discontinue his educational career or vocation, and who through some physical handicap will not be able to achieve his ambition, will challenge our supreme efforts to bring about his restoration. A commissioned officer will find it diffiult in many instances to return to his former employment, and pre-war status. The psycho-neurotic will probably be readily rendered fit, but it should be kept in mind that this type of individual is a tremendous risk, in view of his reaction to injury. In many cases industry will hesitate to employ him because of his instability and our present compensation laws. The psychosomatic problem must extend into the lives, homes and social contacts of the individual in order to successfully bring about a return to normal personality. There will be cases that cannot be successfully rehabilitated and these must be considered misfits. Readjustment must be made through group organization. The medical program must be closely associated with the personnel department of industry and must have the whole-hearted cooperation of supervisors, foremen and others who are in close contact with the returned veteran or disabled employee. Only through the combined efforts of the industrial executives, labor managers, foremen, educational leaders, and medical groups can rehabilitation reach fruition, and gainful employment and other opportunities permit disabled men to resume their rightful places in society. Candidates for rehabilitation must be free from the symptoms either of some physical disability or of a functional disturbance. They must be happy in

their work, with a job that gives them a sense of satisfaction and an assurance that they are an essential part of the organization employing them. They cannot and will not succeed if patronized, for such treatment precipitates a sense of inferiority, which, in turn, is followed by a loss of confidence in others. They must have neither mental conflicts nor mental hazards which will interfere with their efficiency and their power of concentration. They should have a satisfactory home environment and sufficient recreation to preclude monotony. They should never be considered cripples or disabilities upon whom foolish and dangerous sympathy is expended, nor should they be encouraged to exploit their physical handicaps at the expense of their work. During the period of adjustment the applicant for rehabilitation should be examined and checked for physical incapacity by a physician, until successful results have been attained. Recovery actually starts in the hospital by getting the sufferer out of bed in the quickest possible time and by corrective exercises and supervised physical and recreation activity. Chronic invalidism is often caused by allowing a patient to remain in bed too long. He becomes king of a little universe that revolves about him. It is imperative to replace fear and depression with confidence and optimism. Fractures, in particular, should be out of bed as soon as practicable, if necessary on crutches or with the aid of a perambulator. When possible the use of the walking iron or of the various calipers is to be advocated. Too long immobilization of fractures is productive of permanent disability. Manipulation, traction and counter traction should be instituted early in all cases of contractures, particularly after severe burns of the extremities and of the digits. Early skin grafting and the application of active and passive motion to the burned extremities are definite means of early restoration of function. Readjustment following the last war was for the most part a decided failure, largely because it attempted to segregate the injured in institutions, or to give them a financial bonus, or to divorce them from activity by awarding a lump sum settlement for a permanent disability. How much better it would have been to adapt, when possible, such individuals to industry or to business. It would appear only fair that industry should be protected from the possible breakdown of the rehabilitated veteran whose disability actually is the result of service in our armed forces. Restoration of our returned veterans must be interrelated with the problem of post war reconstruction of the entire economic system and not made independent of it. It must be protected from the influences of political and industrial expediency. This result can best be obtained under the guidance of a doctor of medicine. Industrial rehabilitation can be successful only with the full cooperation of the family physician, who should be considered a necessary counselor in securing the confidence of the disabled employee. Under no circumstances should industrial medical organizations fail to maintain the professional code of ethics. The program of rehabilitation should never trespass upon nor transgress the rights and privileges of the private physician. Industry should not be considered as attempting to practice medicine or surgery, but it is sound business to place and maintain an employee at work suitable to obtain production with maximum mutual satisfaction to both employer and employee. The attempt at rehabilitation should not be construed as socialized medicine, but rather a plan to minimize the danger of regimentation both in industry and in the practice of medicine. Neurosis is born of worry, and rehabilitation is virtually a promissory note to the injured that they will eventually be returned to their social and economic status in the business world. The workman should be encouraged not only to look to the plant physician and his nurses for treatment of his compensable ailment, but to consider them also his confidants and counselors. Thus, by the proved methods of intelligent rehabilitation will he find himself entering upon a happier tomorrow."

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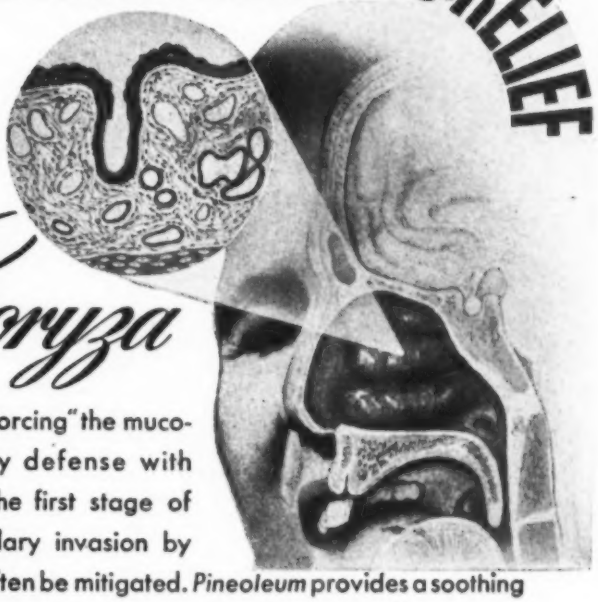

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Silicosis

D. A. MACGREGOR, M.D., Wheeling, "Silicosis — Its Prevention and Treatment," in *West Virginia Medical Journal*, 4:9, 229-236, September, 1945. Extracts: "PREVENTIVE TREATMENT FOR WORKERS: The McIntyre Porcupine Mines, having established and financed a research department de-

voted to the study of silicosis, became pioneers in the attempt to protect exposed workmen by the routine administration of aluminum powder. I think it would be interesting to tell something about the manner in which they have finally determined to make aluminum available to their workmen. It was first thought that the aluminum dust might be liberated where the men worked in the mines. Arrangements were contemplated whereby dust blowers could be made available for certain groups of workers. Another plan was to have aluminum dust liberated by the drilling machines. Another idea was to have the aluminum dust liberated into the atmosphere when the miners set off explosive charges. None of these ideas was very practical. To get the best results it seemed necessary to have the miners breathe the aluminum dust in a relatively heavy concentration which could be measured and which would be approximately the same from day to day. For that purpose it seemed best to use a closed room in which the miners would be exposed to a definite concentration of aluminum for a definite period of time. The whole plan and theory and the steps taken by the company met with the miners' approval and cooperation. When the miners go to work they enter a change room where they take off their street clothes and don their working clothes. When they come out of the mines they go to this same room, take off their working clothes, enjoy a shower bath, and then put on their street clothes. This change room seemed to be the logical place for the administration of the aluminum dust. It was decided that the best time to give the treatment would be when each shift of miners came into the change room to get ready to go to work. It is a trait of human nature to dawdle just a little when changing clothes to go to work. A man is much more likely to be in a hurry when he is cleaning up to go home after the day's work is done. Furthermore, the showers and the presence of a great deal of moisture in the atmosphere would tend to precipitate at least a part of the aluminum dust which it contained. Therefore it was decided to give the aluminum treatment to the miners for five or 10 minutes when they entered the change room to go to work.

PREPARATION OF ALUMINUM DUST: At this point it might be interesting to take up the manner in which fine, fresh aluminum dust is prepared both for the experimental animal and for its use in the protection of the miners. The size of the mill will be determined by the amount of aluminum dust required, but the principle of its construction is the same for all sizes. It is essentially a hollow, metal cylinder which revolves upon a hollow metal shaft which has numerous perforations along that portion which is within the cylinder. There is a partition at the midpoint of the shaft so that air cannot be blown straight through the hollow shaft from one end to the other. If air is blown in at one end, it comes out into the hollow cylinder through the perforations in the shaft which are on the near side of the end. It is therefore evident that air which goes in one end of the shaft will circulate in the cylinder before it goes out the other end. A charge of small aluminum pellets about three-sixteenths of an inch in diameter is placed in the metal cylinder and then the cylinder is rotated at a speed of about 80 revolutions per minute by an electric motor. In a mill about 12 inches long and 12 inches in diameter a charge of about 25 pounds of aluminum pellets is used together with a little aluminum dust as a primer. The whole outfit is properly grounded and also enclosed in a wooden case to eliminate as much noise as possible. One end of the shaft is left open for the ingress of air. The other end of the shaft is connected with a large glass bottle which serves as a settling or sedimenting chamber where the coarser particles of powder drop to the bottom. Another outlet from the bottle permits the withdrawal by suction of the air laden with aluminum dust. At the McIntyre-Porcupine Mines the aluminum powder is prepared in an enormous mill which will produce about 10 pounds per day. It is about three feet in diameter and five feet long and the charge of aluminum pellets weighs over 1000 pounds. The powder is collected in tin cans and sealed until used. It is dispersed into the air of the change room by four dispersal machines operating with about 40 pounds of compressed air. When the miners have assembled, the room is tightly closed. The dispersal machines, situated in the corners of the room, are operated in series, one minute for each machine so as to obtain a uniform distribution of the aluminum dust throughout the

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chamber. The dusting period lasts about 10 minutes. The effects are not disagreeable and they are not harmful. The miners are enthusiastic in their approval of this method of safeguarding their health, and workmen from other mines inquire how soon such treatment will be available for them. As yet we have no statistical evidence as to the efficacy of this form of preventive medicine. The experiment has been in operation only a relatively short time. We must bear in mind that ordinarily it takes 15 to 20 years of such mine work to cause a miner to develop disability from silicosis. On the basis of the animal experimentation and in view of the reports of the fairly succesful treatment of well-developed silicosis by aluminum therapy, which I shall discuss later, it is reasonable for us to assume that the miners who are thus protected by the daily inhalation of aluminum dust will never develop disability due to an overwhelming silicosis. . . .

TREATMENT OF ESTABLISHED CASES: The animal experimentation with aluminum dust was begun at the McIntyre-Porcupine Mine at Schumacher, Ontario, and subsequently moved to the Banting Institute at Toronto, where the work could be carried on in a more scientific manner. DR. D. A. IRWIN supervised the work at Banting Institute. The clinical research on human silicosis has been carried on at the McIntyre-Porcupine Clinic for Silicosis Research, St. Marys Hospital, Timmons, Ontario, by DRS. D. W. CROMBIE and J. L. BLAISDELL and later in Washington, Pennsylvania, by DR. J. W. G. HANNON. The original clinical studies were made upon patients who presented frank cases of silicosis uncomplicated by any other serious disease. A searching physical examination was done together with x-ray to eliminate patients who had advanced heart trouble, diabetes, hypertension, syphilis, and tuberculosis. Respiratory function tests were recorded in all instances. Aluminum dust for inhalation purposes was freshly prepared by a mill, such as previously described, and the patients were permitted to inhale the aluminum-laden air through a tube leading from the settling bottle. The tube is equipped with valves to prevent flow of air back into the bottle. The time of treatment is gradually increased from three minutes to 12 minutes and treatments are given three times a week for a period of 20 weeks or more in a series. The amount of improvement is difficult to estimate accurately. At least subjective improvement was found in all cases. It seemed to be proportional to the amount of disability. The response to treatment was obtained in a very short time. Some of the patients noticed an alleviation of their cough after a few treatments. At the end of three or four weeks the tightness in the chest disappeared and shortness of breath on exertion was improved. DR. HANNON quotes the patients as saying, 'Aluminum takes the leather out of your lungs.' He explains the early relief of symptoms as being due to the ability of aluminum to prevent the formation of silicic acid. In at least 50% of the cases there was a gain in weight and an increased capacity for work. An improvement in lung ventilation was also demonstrable by respiratory function tests. After the preliminary testing series, when patients were chosen only after passing a very rigid physical examination, it was considered practical to establish treatment centers at industrial centers at industrial plants where there is a definite silica hazard. At the present time there are 102 such local treatment centers located at mines and manufacturing plants in the United States. X-ray examinations of the chest are made to determine the presence of x-ray evidence of silicosis and, if possible, to eliminate cases of tuberculosis. From the standpoint of the employer it is very desirable not to recommend treatment to an employee who has tuberculosis. If the tuberculosis flares up while the employee is taking aluminum treatment, he may argue that the treatment precipitated his trouble and that the employer is legally liable. On the whole, the reports from these on-the-spot treatment centers are very encouraging. Out of a total of 143 in one group of workmen, who had positive x-ray findings of silicosis and disability, 135 showed improvement. A few of the men in this group, who had been awarded compensation because of total and permanent disability due to silicosis, went back to work again at their former occupations. Others, who were considered eligible for compensation awards prior to treatment, are sufficiently improved to continue at

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The *crude coal-tar paste* used at New York University, according to Combes, "is manufactured commercially under the name **Daxalan**"—which has been found *superior to distillates, filtrates and pastes containing liquor picis carbonis.*

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(1) Combes, F. C.: Indus. Med., July, 1944.
(2) Parkes, Morey: Indus. Med., January, 1944.

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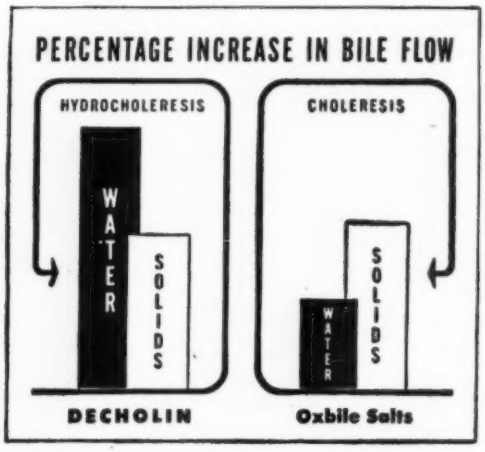

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work and they maintain that they have twice the capacity for work which they had previously. In a group of 104 patients, who had positive x-ray evidence of silicosis but who denied any disability, there were 93 who claimed to be distinctly improved after treatment. The plant production figures for this group are said to show an increased capacity for work. As we said before, it is hard to evaluate the amount of improvement to be derived from inhalation therapy in silicosis because so many of the factors involved are subjective. It is easy for a patient to exaggerate the degree of his disability when he suspects that he has silicosis and it is equally true that he can exaggerate the degree of his improvement after treatment. No amount of aluminum will have the slightest effect upon the areas of the lungs which are fibrosed. The characteristic nodules in the x-ray films, which are the trade-mark of advanced silicosis, are not altered in the slightest degree by treatment. The nodules represent the end stage in an irreversible pathological process. Only the immature lesions are amenable to aluminum therapy. It would appear that the benefits must come from the prevention of the liberation of silicic acid from those particles of silica which are not as yet walled off and barricaded by the layers of collagen and fibrous tissue. When a patient's cough is diminished, his friends and his family testify to the fact. When a workman can go back to his place and do twice as much as he did before without undue shortness of breath, his fellow workmen can testify to the improvement. When a man says he has less tightness in the chest and that he feels better than he did, we have to take his word for it. The method of using aluminum for the treatment and prevention of silicosis has been patented by the McIntyre Research, Ltd., a non-profit organization. Any fees accumulating from the licenses are used in further research on silicosis and kindred hazards with special reference to tuberculosis. The license fee is one dollar per year for each man exposed to silica but this does not necessarily include all of the employees of an individual plant. The cost of the equipment necessary for use in a plant employing 500 to 600 men is $610. This equipment consists of an aluminum powder mill, 50 inhalation valves, and 10 nasal clamps, together with the necessary accessories. Before a plant is licensed, a dust survey must be made by the state or a competent individual agency and a definite program, aimed at the reduction of atmospheric dust to a practical minimum, must be instituted. Furthermore, the prophylactic and therapeutic application of aluminum dust should at all times be under adequate medical supervision."

Employee Examinations

DR. NILS P. LARSEN, "Findings from the Examination of 500 Industrial Employees," in Proceedings of the First Annual Meeting of the Territorial Association of Plantation Physicians of Hawaii, 1944. Text: "Some years ago I had the opportunity to go over the health system of the Eastman Kodak Company. While there I became very much interested in their insistence on trying to solve the problem of overweights and underweights among their employees. They employed a full-time nutritionist who talked to the wives of the men who were overweight or underweight, and tried to adjust their eating habits. They insisted that overweight, particularly, was often the first sign of the dangerous middle age diseases. If that could be corrected, they felt a good many of the middle age or 'wear and tear' conditions could be prevented, or at least postponed. With this experience in mind, we were interested to see how many of these conditions appeared in various weight and age groups in Honolulu. High blood pressure, or a heart condition, or positive albumin or sugar in the urine was used as an indication that there was a beginning deterioration. Although we believe firmly that dietary conditions that produce overweight might affect eyes, ears, nose, throat, teeth and skin conditions, we did not study these separately in the breakdown on the weight basis. This study was based on the recorded findings after a special examination of 500 employees. All these men were on the job at the time the study was made. The defects found and the percentages having defects were listed under general headings as follows: Defect of eyes, 18%; ears, 6%; nose

and throat, 3%; teeth, 39%; high blood pressure, 10%; heart, 5%; tuberculosis, 3%; albumin, 6%; sugar, 4%; Kahn, 2%; skeletal, 10%; skin, 7%; surgical, 7%. The weight groups were based on standard tables for heights, weight and age. For each group we allowed variations of 10 pounds above and below the average normal. In other words, owing to build and type, two men of the same height and age might vary 20 pounds in weight and still fall in the normal group. We believe this gives a more than fair allowance for normal variations. When this group of 500 men was distributed by weight it was found that 203 fell into the normal weight column, 109 in the underweight, and 188 in the overweight class. Total defects per person were as follows: one for the normals, 1.13 for the underweights, and 1.43 for the overweights. We then analyzed those with high blood pressure, heart, presence of albumin and presence of sugar in the urine, and separated them into groups of under 40 and over 40. These conditions are called 'middle-age conditions' because they are largely due to the 'wear and tear of time,' and often appear earlier in those with poor living and eating habits. There were 127 middle-age conditions found distributed 62% in the overweight group, 11% in the underweight group and 26% in the normal weight. In the group overweight and over 40 there were 5.8 times more of the middle-age conditions found per 100 men than in the group underweight and over 40. In this group of 500 there were 53 men who were overweight and over 40. Apparently with increasing years, overweight has a definite tendency to throw a strain on the heart and circulation. It is this strain, or this with other factors, that possibly produces that peculiar arterial damage that results in coronary disease, high blood pressure, kidney damage, diabetes, etc. On our plantations last year 406 individuals were reported as suffering from some type of heart condition, 395 from high blood pressure, 316 from kidney disease, and 343 were suffering with endocrine disturbances, many of whom had diabetes. A great deal has been done in the preventive program of trying to keep children solvent, and by keeping them so, hoping that they will grow up into stronger adults. Nevertheless, in America when the great mobilization came, it was found that 30% of our young men were in such poor condition that they were unable to carry a rifle for the defense of their country. It would seem doubly important, therefore, to see what can be done about making people over 40 solvent. The number of people under 40 is decreasing, and the percent over 40 in America is increasing. If these people are to be effective citizens and not decrepit ones, it is necessary to develop more interest and a constructive program to try to prevent or postpone these conditions of middle age which tend so frequently to produce incapacity. It is in this group that we could perhaps salvage the greatest number of work days for the reconstruction period. To find out about these and apply corrective measures, regular physical examinations are necessary."

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Kaiser's Vision

ONE of the most prominent of the industrial czars has ideas for promoting "competitive health" by the establishment of a series of group health clinics through bank loans guaranteed up to 90% by the Federal Housing Agency to be made available to groups who undertake to provide prepaid medical care. Mr. Henry Kaiser, writing as guest columnist recently in Drew Pearson's Merry-Go-Round, urging support of a bill he is drafting to accomplish this objective, wrote meditatively: "I can see little Mayo clinics springing up all over the nation. Founded on the sound economics of prepaid medicine, these clinics would operate as going business enterprises, competing to reduce their cost, improve the quality and expand the scope of their service to the public. Medicine has a vast market awaiting it in the half of our population that today receives inadequate medical care or no medical care at all. Prepaid competitive medicine, backed by adequate facilities, can reach that market immediately. Construction and operation of the facilities would provide employment — let me be specific — for 3,000,000 men and women." And thus we may expect a merry-go-round of socialistic planning interesting to watch.

—Medical Economics, *Minnesota Medicine*, September, 1945.

INDUSTRIAL HEALTH and DISEASE

A Program of Industrial Vision

L. HOLLAND WHITNEY, M.D.,
Medical and Employee Service Director,
Sperry Gyroscope Company, Inc.,
Great Neck, L. I., New York

UNPRECEDENTED demands for war production and the resultant expansion of personnel have served to identify numerous problems, some of which are directly related to the field of industrial health. One such problem encountered within our organization has led to the development of a program of industrial vision. Because this is a relatively unexplored subject, it has been necessary to proceed cautiously and to change the details of approach from time to time as new concepts have gained acceptance.

Reprinted from *Executives Service Bulletin*, Metropolitan Life Insurance Company, June, 1945.

The Sperry Gyroscope Company, Inc., is engaged in the production of precision instruments for the armed forces. In the early months of war production, the demand for such equipment resulted in a rapid expansion of the number of employees to considerably more than 10 times the pre-war force. Like all other concerns which faced similar problems, large numbers of unskilled and untrained workers were recruited. In many instances new employees were women who had never had any previous experience.

In one particular department, women were hired and given a short course of training in calibration. In accordance with the usual custom, all such new employees receive a complete preplacement physical examination prior to their work assignment. This examination provided for the usual test for visual acuity at 20 feet. These tests were made first without glasses and then, if the applicant wore a correction, with glasses. The vision at 14 inches on the standard American Medical Association card was also recorded, both with and without correction.

It was soon apparent that production urgently needed was being delayed by the relatively high proportion of girls who failed to learn the job after two weeks of training. And those who failed appeared to have the dexterity and learning ability for the job. Also, other new employees of similar age and background had mastered the work. After a careful analysis of the job had indicated that success in this work might depend upon the individual's vision, the physical examination cards were checked in an effort to find an answer to this problem. All had passed satisfactorily according to our then established visual acuity requirements.

Origin of Eye Safety Program

BECAUSE this particular job required unusual visual application, the psychologist in charge of employment testing was not satisfied that this was the final answer, and interested the medical department in making a more thorough analysis of the visual performance of such a group. The results showed that the girls who were unable to perform at an average rate were definitely below average in near-point vision. Accordingly, a recommendation was made that more comprehensive measurement of vision should be undertaken on employees who were to be assigned to this type of work. In this way the eye program was initiated.

An instrument which identified several factors in visual performance was placed in the employment office. The next step was to employ an optometrist and a part-time ophthalmologist to assist us in developing a vision program which could meet this and other allied problems. Soon thereafter, the safety director called our attention to the high incidence of eye accidents and the resultant compensation insurance costs. Here was an excellent opportunity to justify the cost of a comprehensive eye program. In New York State, loss of vision in one eye results in a direct insurance cost of $4,000. Indirect costs have been estimated as several times this figure. When we consider the even more important humanitarian aspect of the problem, it is not difficult to justify the necessary expenditures. Moreover, several other large companies already have demonstrated the economic soundness of an eye protection program. These facts served to convince management that the cost of eye protection and correction was justifiable.

From these humble beginnings, we have conceived an eye protection-correction program which now is well established. Our efforts presently are directed into two major categories: first, placement of applicants into positions for which they are qualified visually as well as physically; second, providing safety glasses free of charge to all employees assigned to hazardous areas. These glasses are made with either plano lenses, where visual correction is not necessary, or with prescription-ground lenses where the employee's vision can be improved for his or her particular job.

The first-mentioned objective is accomplished in the following manner: Each job classification has been studied and the visual requirements for the job group established. Published studies indicate that individuals who possess fully the necessary visual ability for a job make better operators. This has been demonstrated in machining operations, assembly, and inspection. While there are no statistics to prove it, we think it not unreasonable to presume that job satisfaction is greater, absenteeism reduced, spoilage of critical parts lessened, and employee health and stamina promoted by lessened fatigue in cases where the vision is suitable for good job performance.

Consequently, we have adopted a routine in which all applicants for employment, who are to be assigned to the manufacturing area, are given a visual performance test. This test is accomplished by an instrument which measures separate visual abilities. The results of this test are recorded on a card, and the findings are matched against the visual requirements of the particular job. If the applicant does not meet the requirements there are two possible dispositions: reassignment to a job for which he is qualified visually, or referral to the company eye specialist

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for complete examination to determine whether or not the vision can be brought up to the necessary level of the job. Other factors, such as previous work experience, usually decide which of the two procedures is followed.

The second goal of the eye program is to provide safety glasses for all employees assigned to machining or foundry operations, where eye accidents are most prevalent. Much has been said and written about eye protection programs, and our approach to the problem has been influenced by the experience of other companies. In the belief that it is better to wear some protection all the time rather than complete protection some of the time, we have chosen a light and durable spectacle-type frame. Side shields and other heavy goggles are reserved for a very few jobs which require that special type of protection.

Adjustments, Fittings, Repairs

EMPLOYEES will not wear safety glasses if the glasses do not provide adequate correction. A correction suitable for *specific* job requirements and performance is sometimes not the same as would be prescribed for general use. Therefore, we provide complete eye examinations by specialists for those employees who need attention.

Also, it is not unreasonable to presume that some employees refuse to wear eye protection because it is out of adjustment or needs care. To overcome this objection, trained opticians are available to make the necessary fittings, adjustments, and repairs.

If all this sounds expensive, let me set down a few facts. In the first six months of operation, the eye program cost less than $30,000. This included professional and clerical salaries and cost of the glasses. During that time we have accumulated and have on exhibit 16 pairs of safety glasses which have prevented serious eye injury—in many instances, an injury which would undoubtedly have resulted in the complete loss of vision in one or both eyes, from the insurance standpoint. Taking the $4,000 figure previously mentioned, it does not require any advanced mathematics to prove that the program has been justified on this basis alone, without considering the factors of improved health, lessened fatigue, and better employee relations. Furthermore, the humanitarian aspect of such prevention of personal loss and suffering is worthy of great consideration.

Certain interesting facts have been brought to light as a result of these studies. Nearly 50% of the average employee population require refraction for maximum visual efficiency. Most of that number have never had a previous eye examination. Nearly 40% of our employee population were wearing corrections. In many instances, these corrections were no longer adequate. The proportion of those who do not have corrections and at the same time lack adequate vision for the job is approximately 25% of the total employee population.

In this respect such a program directed toward the better health of employees is the best type of health education. Surely the 50-year old presbyope who never wore glasses previously will be a loyal booster to fellow employees as well as a good influence on his family and friends outside the company.

The exigencies of war frequently make direct or indirect contributions to the sum and store of medical knowledge. It is significant that a problem which arose from a wartime condition has developed logically into an eye-care program which we think is justifiable. The implications of studies already published regarding the broad subject of industrial vision are a real contribution toward better health programs in industry. As precision manufacturing progresses and greater demands are made on the people who make such production possible, industrial health must necessarily keep pace with the demands. It is with these motives in mind that those charged with the responsibility for the health of any industry will do well to consider the visual problems involved.

This venture into the field has demonstrated that teamwork is essential among various departments within an industry. The training department, through the psychologist who represented it, was the first to point out the need. The medical department has developed the plan with the assistance and complete cooperation of the safety department. The program has also demonstrated that teamwork can exist between the various professions. The safety engineer, psychologist, optometrist, ophthalmologist, and the general industrial physician can cooperate fully when each is contributing his part toward the achievement of a predetermined objective.

The studies which have been made

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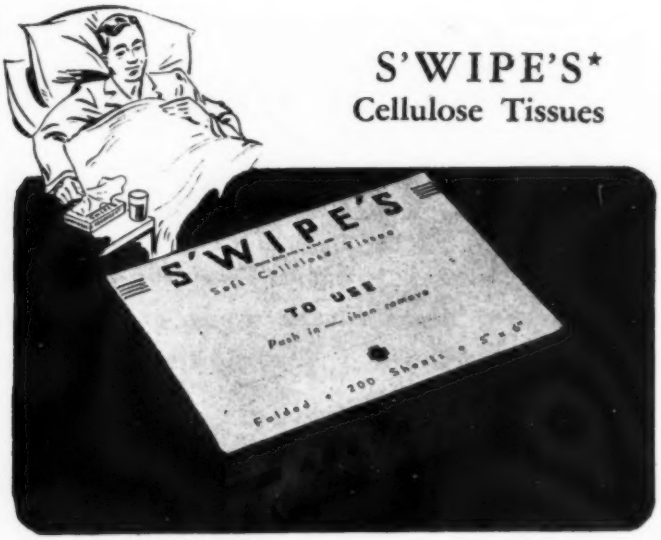

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thus far lead us to believe that we are only beginning. Already it is apparent that there are many other factors which influence industrial "seeing."

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ILLUMINATION, color contrast painting of machine tools, color painting of the factory environment, vision training to improve certain visual skills, special considerations of the visually handicapped, vision problems affecting safety measures (for example, in reference to accident proneness or special exposures), serve to illustrate this point. Further research on these and on other vision problems are being encouraged because of their potential values to this and to other industries.

To summarize, visual performance is probably one of several important basic skills which influence employee efficiency. Measurement of visual performance and consideration of this to provide better placement in industry should be in some measure helpful to employers, employees, and the industry itself. It is not presumed that this test alone will solve all problems of inefficiency and maladjustment. However, since visual performance can be measured, it is a logical point of attack.

A safety program for eye protection can be successfully combined with a general approach to the problem of vision in industry. Indeed, because of its obvious values to all concerned, the safety program can well be the starting point.

It is increasingly clear that there is much left to be learned regarding the subject—and some of the reasons why we believe it deserves further investigation have been mentioned in this article.

Protein Hydrolyzates and Burns

IF A PROTEIN is hydrolyzed into its constituent amino acids by the use of acid, alkali, or enzymes, the resulting mixtures are called protein hydrolyzates or protein digests. Such hydrolyzates are finding new uses because they contain the concentrated nutritional value of the intact protein and can be administered either orally or intravenously, provided the proper precautions are taken. They are now commonly employed as temporary expedients in supplying the nitrogen requirements of the body especially where it is difficult or impossible to supply the body's needs through the agency of the diet. Protein hydrolyzates ordinarily supplement a decreased ingestion of food, but may also furnish the entire protein supply, usually by intravenous administration. In this way the hydrolyzates are given in a manner analogous to glucose (dextrose) which is used to meet the needs for energy. In order to prevent the protein hydrolyzates from being wastefully utilized merely as a

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source of energy, glucose is given simultaneously. According to Gaunt (*Nutr. Abs. Rev.*, 13, 501-507 (1944)) a solution of 2.5% protein hydrolyzate and 10% glucose is commonly employed and injected at the rate of 300 to 500 ml. per hour. The application of such protein hydrolyzates in the nutritional care of burns is an interesting technique that has enjoyed a remarkable development, especially in conjunction with routine methods of treatment. Of course the protein hydrolyzates do not supplant the use of sedatives, blood plasma, dressings, sulfa drugs, or penicillin therapy in the immediate care of burns or the shock resulting therefrom; rather the hydrolyzates are effective in maintaining protein nutrition at a desirable level. In severe burns one of the chief factors in loss of body-weight is the sudden loss of nitrogen, chiefly through (1) the escape of nitrogen into the burned area, (2) the substance that oozes from the burned area, (3) increased loss via body excretions, and (4) loss through inability of damaged body tissues to digest protein. In burns this considerable loss of nitrogen is minimized or compensated for by the use of protein hydrolyzates. It has been variously reported that the urinary output of protein as nitrogen may be as high as 28-45 grams daily, with great variation in individual cases. Absence of infection and fever is often important in determining the amount of protein excreted. Other factors, some known and others unknown, greatly influence the total quantity that can be measured. Obviously, the loss in severely burned individuals is greater than can be compensated for by taking food even if the appetite remains. Cases of loss of appetite (anorexia) are quite frequent and cause poor calorie and nitrogen intake. In such cases administration of protein hydrolyzates, usually prepared from casein, may suffice to maintain a nitrogen balance. One of the greatest disasters of modern times, the Cocoanut Grove fire in Boston, serves as an example of the use of protein hydrolyzates following burns. A monograph in the *Annals of Surgery* (117, 801-965, (1943)) has been written concerning the various forms of treatment used for the burned victims. A study of 109 of them showed that all patients with 10% or more of the surface area of their bodies involved in third degree burns became serious nutritional problems because of loss of nitrogen in the urine and from the surface, and because of the increased nutritional requirement resulting from infection accompanied by fever. Tui and co-workers (*Ann. Surg.*, 119, 815-823 (1944)) in a study of the nutritional care of burns have stated: "If half of the body surface of a man weighing 70 kg. (154 lbs.) and 170 cm. (5 ft. 7 in.) in height were to be involved in a burn, the 9,050 sq. cm. so involved would lose, according to one rate (referring to case report), 3.8 g., and according to the other rate, 19.9 g. of nitrogen in 24 hours. The former, namely, 3.8 g. of nitrogen, would be 23.75 g. protein, or the equivalent of 4,000 ml. of plasma, or of 114 g. of meat; and 19.9 g. of nitrogen would be equivalent of 124 g. of protein, over 20,000 ml. of plasma, and 600 g. of meat." Therefore, they conclude that to maintain a patient in good nutritional condition under such circumstances the feeding of meat or transfusion with plasma would be an impossible task physically and economically. The cost of hydrolyzate treatment is compared with a corresponding quantity of meat as costing four times as much, while the cost of a corresponding amount of plasma would be prohibitive. To these investigators the use of protein hydrolyzates appeared to be a solution to the problem of nutritional care in severe cases of protein drain. They also feel it may be practical to work out a formula of amino-acid feeding for burns of different extent.

—Nutritional Observatory, September, 1945, Edited by the Staff of Heinz Nutritional Research Division in Mellon Institute.

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